MOTOR AGE

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ANNOUNCEMENTS

In the issue of Motor Age for November 2 will be featured the commercial vehicle industry of the year. What strides have been made and what prospects indicate will be taken up in detail and specifications of all models will be given.

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MOTOR AGE

In the Footsteps of "Old Hickory"

By William K. Gibbs

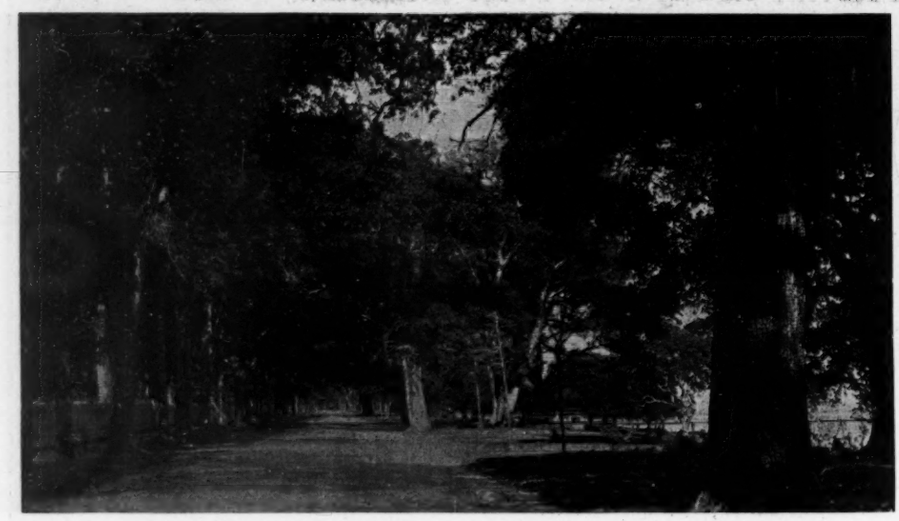
A natural stone bridge near Hamilton, Ala., on the proposed Jackson highway. This bridge is 60 feet high, 30 feet long and wide enough for a car to cross

Both Mississippi and Alabama Claim Right to Highway in Honor of Andrew Jackson—Best Road, Not Sentiment, a Factor in Making Choice

IF THE spirit of "Old Hickory," as Andrew Jackson was affectionately termed, could come back and point the itinerary he traveled on his way to New Orleans and the course of his return after his great success in New Orleans, locating the Jackson highway as a memorial to him might be a much easier task. Both Mississippi and Alabama want the honor of having a highway dedicated to the hero of the war of 1812. A year ago the Jackson Highway Association sent a pathfinding party out from Nashville, Tenn., over the Mississippi route to New Orleans and back through Alabama. So much pressure was brought to bear on the officials of the association at a later meeting in Nashville that is was deemed advisable to postpone the official designation south of Nashville for a year and both states were asked to go ahead and put their respective roads in shape, the association adding a promise to send the same pathfinding party over each route at the end of a year and the route that showed the most improvement and having the most feasible highway into New Orleans would be officially designated the Jackson highway, the findings of the pathfinders to be final.

Colored supplement from Alabam'. The smiles may be natural, but possibly the jitney each helped it to endure

October 2 the same party left Nashville, details of the trip through Mississippi to New Orleans having been given in the last issue of Motor Age. October 17 the party finished the inspection upon their arrival in Nashville, but their report to the board of directors of the highway will not be made until some time in November. Meanwhile, both Alabama and Mississippi are very much in the same position as they were before the pathfinders made



Section of the proposed Jackson highway through Pass Christian, Miss. Live oaks festooned with Spanish moss meet overhead, making a bower over the shell road along the Gulf

their inspection. Both states believe they should have the route; although the spirit of Alabama is exemplified in the story of a man who approached the adjuster of a certain dispute, saying: "I want you to be fair with both of us. I don't want you to cheat the other man and I don't want you to cheat me, but if you cheat anyone, don't cheat me."

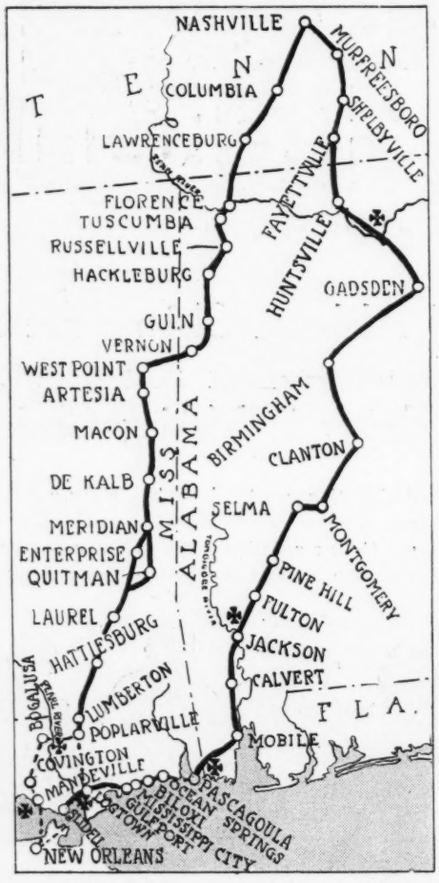
Mississippi is quite the opposite. Those who have worked for the road in that state want the highway, but not infrequently we heard the expression: "If we don't get it we will have a road anyhow."

I shall not take it upon myself to say which is the better road, but will point out a few facts about each route and leave it to the reader to judge which highway he prefers if he is contemplating a trip to New Orleans in the near future. One year hence both routes should be materially improved and a choice will be easier.

A Difference in Mileage

Mississippi's route measures approximately 563 miles; Alabama's 782 miles. Mississippi's route is practically built except for two counties and a short stretch in one other. More construction will be necessary to complete Alabama's road. At present there are two ferries on the Mississippi route, one of about 500 feet across the Pearl river between Poplarville, Miss., and Bogalusa, La., and one of 22 miles across Lake Pontchartrain. Looking at the Alabama route from the same viewpoint—the present—there is a ferry across the Tennessee river near Huntsville, Ala., one across the Tombigbee at Jackson, Ala., a 9-mile ferry across Pascagoula bay, a 12-mile ferry across the lower Pearl river and one of 22 miles across Lake Pontchartrain, the latter being the same as the one mentioned on the Mississippi route.

Money for building the unfinished road through Mississippi has been raised with the possible exception of a short stretch through Lamar county in Alabama, where the road enters Mississippi and it seems likely that the money for this will be forthcoming. In Alabama there is a bad stretch of nearly 75 miles north of Mobile to Jackson, and the prospects for building a good road there are not very promising since the 40 miles south of Jackson in Washington county hardly touches a town, much less the county seat, and the county is poor and funds difficult to raise. Possibility of bridging the Tombigbee seems remote and it appears to the writer that even with a good ferry it would be folly to attempt to cross when the water was at its highest stage.



Map showing the two proposed routes for the south end of the Jackson highway. The dotted lines show where present entrance to New Orleans must be made. The line from New Orleans to Slidell is building, and from Poplarville south there is a road, but this soon will be improved. The crosses represent ferries

Pascagoula bay is a problem. One has to ferry 9 miles to go 2, but a large part of the bay will be bridged and a free ferry maintained, a draw bridge not being allowed into Pascagoula since there is a railroad draw within a short distance of the proposed ferry and the government does not sanction two draws so close together. Money has been raised to bridge the Pearl river and when this is done, either the Mississippi or Alabama route will use it. There is a herculean task of building a road across the salt marshes over Chef Menteur and the Rigolets out of New Orleans to connect with the proposed Pearl river bridge, but the nature of this is such that it demands a separate story which will appear in a later issue. There is no possibility of this link into New Orleans being finished until next summer or possibly in the fall, so no matter whether you tour over the Alabama or the Mississippi route, your only access to New Orleans at present will be via ferry across Lake Pontchartrain.

Alabama has the best hotels, but those on the Mississippi route are adequate and much better than are found in many cases on the transcontinental routes.

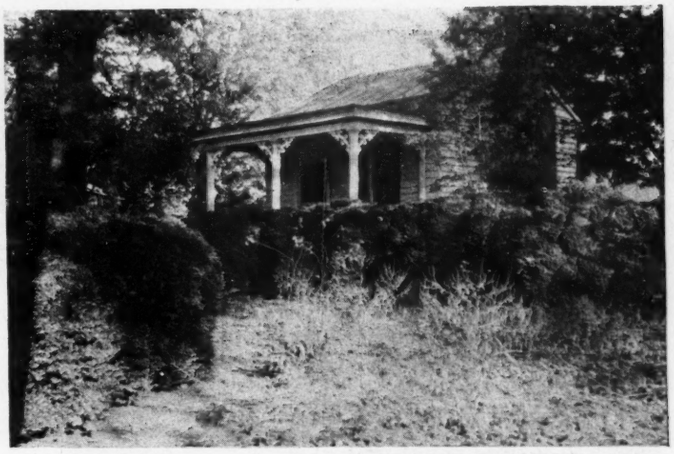
So much for the main differences between the route through Mississippi and that through Alabama. Getting back to what we saw on the trip north from New Orleans and what you will want to see if you tour that way, I will tell you as specifically as possible of the main points of interest.

We left New Orleans Monday afternoon, after having spent 3 days in the Crescent City. I would not advise trying to see New Orleans in 3 days; it simply cannot be done. You may inspect it superficially if you don't care very much about sleep. Natives of New Orleans know how to play and they also know how to work. I put play first in this case, even though it is a perversion of the old saw about business before pleasure, for the old spirit—seeking freedom—that brought the first settlers away from repression in France seems to run in the veins of the present generation. However, I shall tell you later what New Orleans is and what it has been.

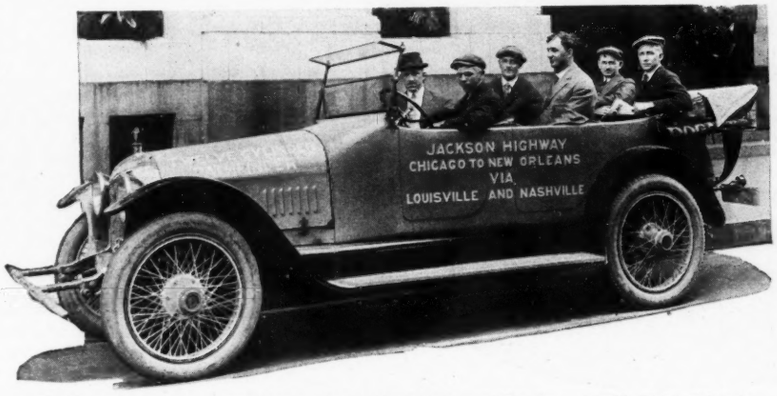
Leave New Orleans at Night

Getting out of New Orleans now is a night proposition. The ferry leaves Milenberg, a suburb of the Crescent City, at 4:30 p. m., arriving at Mandeville, on the north side of Lake Pontchartrain, at 6:30. The fee is $5 for a car and 75 cents per person. Returning, the ferry leaves Mandeville at 6:15 a. m. After landing we headed for Covington, 10 miles west of Mandeville, since the hotel accommodations there are better than those at Mandeville. Covington's slogan is, "In the Heart of the Ozone Belt." It is a health resort.

Washington county, Ala., has several gates across the road to keep stock corralled. These can be opened and closed from the car



Birthplace of Helen Keller at Tuscumbia, Ala. It is also the birthplace of her brother, W. S. Keller, Alabama state highway engineer

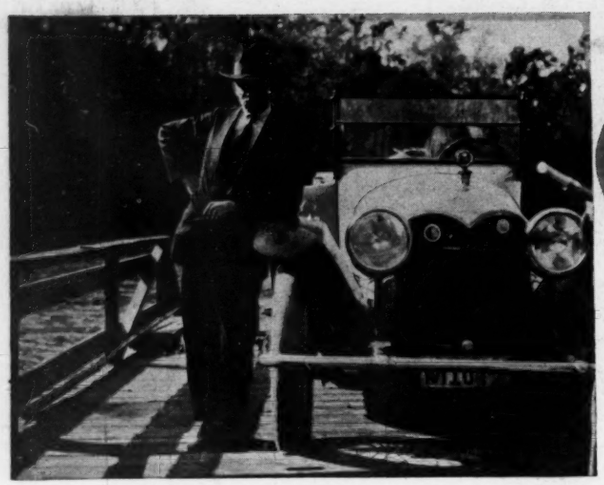


Pathfinder twelve and party as they checked in at the Grunewald, New Orleans

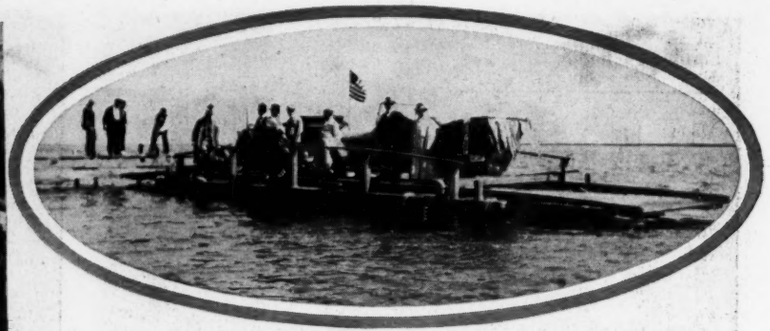
Below—Capt. John Craft, president of the Alabama highway commission, and G. B. Green, Irvington, Ala., Satsuma orange grower, manning the Tombigbee ferry

A trio of pathfinders cruising on the Glendoveer as guests of the commodore. The trip was on Lake Pontchartrain and Chef Menteur

Above—A frequent scene in the piney woods of southern Mississippi. The old and the new types of locomotion on the highways offer two very remote extremes. In oval—The pathfinding party on the lawn in front of T. J. Bolster's home, Quitman, Miss., where they were guests at breakfast after a 40-mile drive from Meridian



We circled about in the many channels of the Pearl river, going 12 miles to get 3, and spent 2 hours getting from Indian Village to Logtown on this type of ferry—a scow towed by a gasoline launch



Embarking on a 9-mile ferry across Pascagoula bay

This represents the approach to the man-power ferry across the Tombigbee river at Jackson, Ala.

This is the ferry across Lake Pontchartrain, which must be used at present, no matter which route is followed

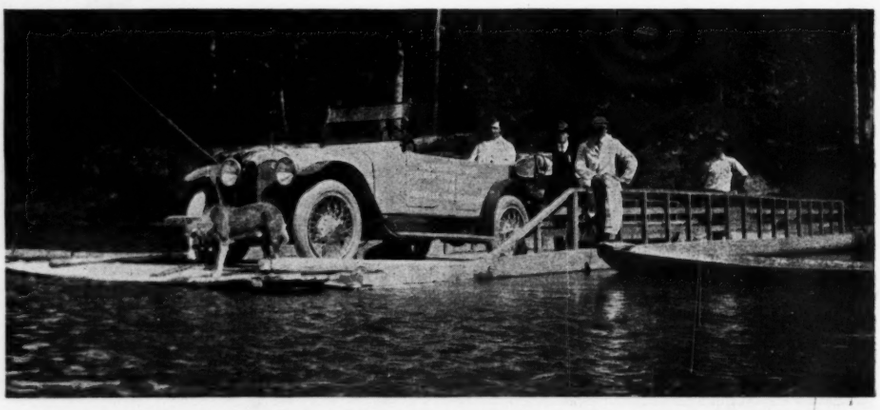
Whether the sign I saw next to the hotel had an particular significance with reference to the mortality rate, I do not know, but I'll give it to you as cheaply as I got it. It says: "Complete funerals 10 cents a week."

Next morning we retraced our path to Mandeville and then on to Slidell, driving the 30 miles in 50 minutes. Breakfast was the objective, so speed limits were not observed. After breakfast at one of those hotels where the only thing they ask you is: "How will you have your eggs, boss?" which, by the way is quite common in the South, we drove to Indian Village where the ferry across the Pearl river awaited us. Incidentally I might say that the Pearl river does not seem to have any particular place to go, but wanders around the bayous promiscuously. This is a dry season of the year, too, but when the water is high they say that even the crocodiles cannot find a dry place in the woods in which to sun themselves. After a 2-hour ride through channels of varying width, the edges of which were decorated with water hyacinth and alligators enough to make grips for the whole American traveling public—possibly I ought to except a few of these—we came to Logtown, although why it is not called Westontown is a mystery to me. It was the Weston ferry that brought us to Logtown, the Westons own the mills there, and if I met one it seems I met fifty of that name. With the backing of the Weston family it seems that that Jackson highway and the bridge across the Pearl river near Logtown must come to a successful conclusion in southern Mississippi. H. S. Weston, who heads the Weston lumber interests in Logtown, is an official of the Jackson highway and an enthusiastic one, too.

The next stop was Bay St. Louis, both the name of the town and the body of water beside it. Here we had to head north and make a 30-mile drive around the bay to get to Pass Christian, although we could see the Pass from Bay St. Louis, the town. The Gulf of Mexico has taken some rather large bites out of the shore line of southern Mississippi and Alabama. If one were to follow the coast line all the way the distance would be considerably greater. The road around Bay St. Louis is not what I should call a good road, although parts of it are good, especially where it has been shelled.

Pass Christian, Gulfport and Biloxi form a trio of cities along the Gulf in which it is difficult to tell where the limits of one stop and the other begins. These three cities might well be termed the American Riviera. With the blue waters of the Gulf on one side, magnificent residences on the other, a shell road that is a veritable ribbon of white stretching through two rows of live oaks, the branches of which meet overhead, all festooned with Spanish moss, the tourist becomes so engrossed in the surroundings that he is loath to leave such pleasant associations.

In The Pass, as people of that locality are wont to term Pass Christian, are such



The Pearl river ferry on road between Poplarville, Miss., and Bogalusa, La., is one of those kind that is propelled by the current of the river. A rope runs through pulleys on a cable and by shortening one end of the rope the nose of the ferry is pointed partly up-stream, the current moving the ferry forward

Section of road through the Mississippi pine woods

Stretch of new road in vicinity of Russelville, Ala.

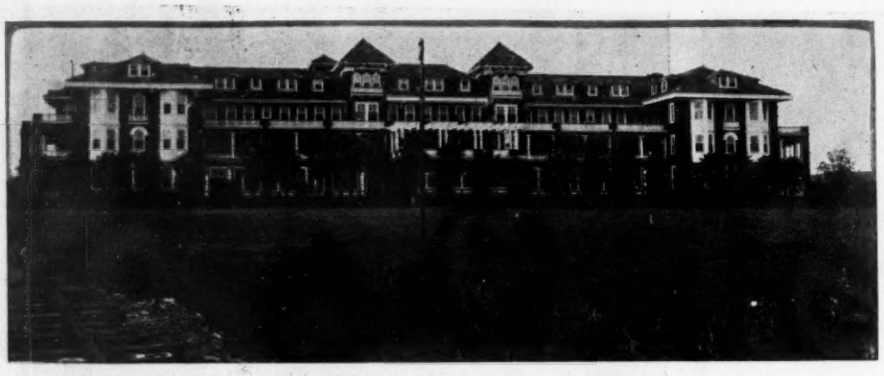
1,000-foot causeway over Pearl river bayous near Bogalusa

This is typical of the drive along the Gulf in the vicinity of Biloxi, Miss. The live oaks covered with Spanish moss present a pleasing picture which lingers in the mind long after one passes them

Dallas county, Ala., makes all its bridges with concrete floors. Note road grade also

Half-mile causeway across Biloxi's "Back Bay"

Type of road found in and out of Laurel, Miss.



Great Southern hotel at Gulfport, Miss. This is the most attractive hotel we saw on the whole trip. The grounds are like what one would believe Utopia to be

places as the winter home of President Wilson, the residence of John W. Parker, candidate for vice-president on the Progressive ticket and other notables. Pass Christian, Gulfport and Biloxi are the playgrounds of those New Orleans people who play the hardest.

We visited the grounds that will be transformed into the home of the Mississippi centennial just to the east of Gulfport, stopped at Beauvoir, once the home of Jeff Davis and now a confederate soldiers' home and made a night stop at Biloxi, named for a tribe of Indians found there when the first white settlement was made in 1699, and meaning, "a people between two waters." An arm of the bay runs back of the city and thus Biloxi, like Boston, has its "back bay."

A sea wall is to be built along the Gulf to give protection to these three cities, a shell road will be built along the sea wall and thus the road will be protected from the wash of the Gulf, which has played havoc here in the past. Oyster and shrimp fishing are the principal industries of these cities.

Mobile was the next night stop after Biloxi. The roads need considerable repair as the storm of last summer nearly destroyed all the roads along the Gulf and for 50 miles or so inland. This is the heart of the Satsuma orange industry; a new adjunct to the citrus fruit belt, imported from Japan. A short side trip was made to Irvington just before reaching Mobile to see the orange and pecan groves. There is 2,500 acres of oranges and pecans there now and all owned by natives of northern states except three small groves.

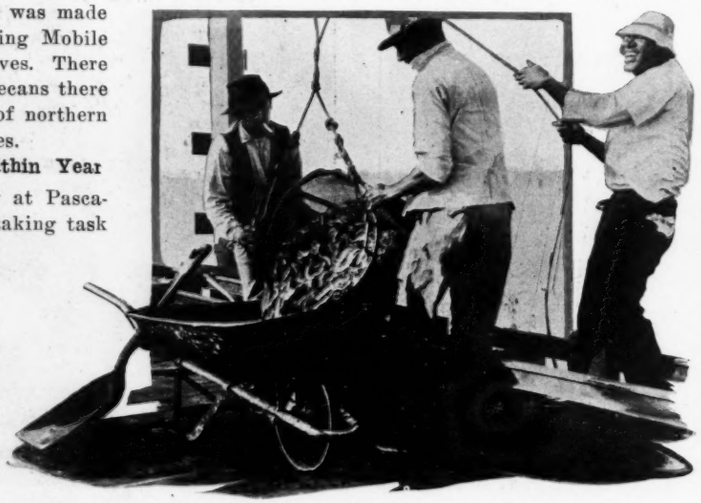
Pascagoula Ferry Possible Within Year

It is possible that the ferry at Pascagoula will not be such a time-taking task within another year, as money has been raised to bridge a good part of the 2 miles across this neck of the bay. Mobile county has some fairly good roads and promises much improvement, although when we turned north from Mobile the good roads did not last long. This road north of Mobile and through Washington county, Ala., as previously mentioned, form the worst part of the Alabama route.

On the road through Washington county we found gates across the highway at several places. I understand the people whose cattle graze in these localities found it cheaper to put a gate across the road than to fence along each side of the road. However, by pulling a wire, which may be reached while sitting in the car, the gate swings open and pulling another similar wire on the other side closes it.

The ferry across the Tombigbee at Jackson, Ala., is not such a problem when the river is low, but when it is high a landing must be made considerably back from the river bank proper. At present there is a man-power ferry, but plans include a power ferry. Money was raised to bridge this stream, but the plans called for a narrower draw than the government would allow, so the project seems to be a dead issue, at least for the immediate future.

H-A-double-R-I-G-A-N spells good roads in Clark county, Ala. Mr. Harrigan is the head of the Scotch Lumber Co., Fulton, Ala., and he has taken it upon himself to see that Clark county's part of the road is built, and when the work now under way is completed the road will be a credit to the county. As an evidence of the interest Mr. Harrigan takes in his fellowman, he has built a nine-hole golf course and a clubhouse at Fulton, where he requires every employee to play 2 hours daily. That is a part of the day's work, and he says the results toward greater efficiency are beyond what he contemplated.



Some of these may be in your salad. Shrimp being unloaded from the boats at Biloxi, Miss.

The road in the vicinity of Thomasville and on to Montgomery took us through gently rolling country with much progressive farming all along the way. Montgomery, the cradle of the Confederacy, is rich in historical lore and has some fine loop drives that offer possibilities for the tourist with a little time to see some very attractive scenery.

The day's drive from Montgomery to Birmingham, the Pittsburgh of the South, takes one into the more mountainous sections and the road immediately out of Birmingham is a series of loops and curves, all well graded and with plenty of turning radius. Birmingham is a unique city. The business section lies in the valley and around the valley on all sides up to the top of the mountains are the residence sections. The majority of the houses are built on other than level ground.

Mountains, but not the kind you find in the West, will be found practically all the way north from Birmingham to Nashville. Some of the road north is ideal and then there is some that will always linger in the minds of those who ride over it without any particular pleasure. However, the expression of one man in the South, that, "Too many roads are built with the mouth and not with a shovel," may not apply to these bad sections of road. Those who promise that the bad spots will be made good spots seem sincere and it is not at all unlikely that within 2 or 3 years either the Alabama or the Mississippi route will be hard-surfaced, finished roads and that one driving to New Orleans will have an option, although there will be only one Jackson highway. However, if the state left off the official route goes ahead and builds its road, it will get travel, for one never knows just where a tourist may go if the roads are good.

HORSE PASSING; VETERINARIANS ALSO

St. Louis, Mo., Oct. 21—A farm correspondent of a local paper writes from Delphos, Kan., in the Arkansas river valley, that the very general use of tractors in that vicinity is making a difference with the future of the youths of the community. Many had planned to become veterinarians but the last 2 years they have seen the "hoss doctor's" business drop they are taking up mechanics.

The same day brings news from Topeka that a course has been established in the high school there to teach the pupils the proper control of car and an appreciation of traffic rules and requirements. Thus it would seem that Old Dobbin soon will be without his family physician.

National Re-incorporates

New York Corporation Takes Over Holdings of Indianapolis Company

80,000 Shares Without Par Value—Officers Will Be Retained

INDIANAPOLIS, Ind., Oct. 24—Special telegram—The National Motor Vehicle Co. today announced the formation of the National Motor Car and Vehicle Corp. of New York, to take over the holdings of the Indianapolis company. The new company has a capitalization of 80,000 shares without par value, 53,000 of which have been over-subscribed by public investors. The remaining 27,000 are held by private interests, including many officials of the old company.

A. C. Newby, president; W. G. Wall, vice-president and George M. Dickson, secrtary-treasurer of the old company, will be the officers of the new organization. Directors of the new corporation in addition to the above are Stoughton A. Fletcher, of Indianapolis; O. J. Thomen, of Redmond & Co., New York; Leonard Snyder, of Leonard Snyder & Co., New York; Buell Hollister, of Pyne, Kendall & Hollister, New York. The corporation at first will be a holding company for the entire capital stock, but in the near future will take over the company as a going concern. Investors have been informed that net earnings for year to end June 30, 1917, will be $1,000,000 on a maximum output of 6,000 cars.

DE PALMA GETS 50-MILE RECORD

New York, Oct. 20—Ralph de Palma was today granted an official 50-mile speedway record for his performance on the Omaha 1¼-mile speedway in his Mercedes racer July 15. The record for the 50 miles is 29:02.47, or a speed of 103.45 m. p. h. The previous record was held by Dario Resta in his Peugeot and was established by him June 8, 1916. Resta's time was 31:57.40. In addition to granting this record the contest board of the A. A. A. in regular session today reinstated driver Hirst, and refused a telegraph application of Eddie Hearne, now driving with an outlaw organization.

At its next meeting, to be held Tuesday, October 31, the contest board will revise the racing rules for the 1917 season. It wsa decided also to issue a 1916 record book in which will appear the performances of all cars finishing in the money in sanctioned events during this year. At this meeting will come up the question of advertising on the part of three manufacturers, complaints having been registered with the board that all three have not been advertising in accordance with the performance. Some of them have been using the word "stock car" when the competing cars were free-for-alls.

CRAWFORD FOUNDER DEAD

Hagerstown, Md., Oct. 13—R. S. Crawford, founder of the Crawford Automobile Co., this city, and one of the pioneer bicycle makers in this country, died yesterday in Pittsburgh at the age of 70. He was a native of Gettysburg, Pa., and a graduate of the Mechanical Engineering School of Glasgow, Scotland.

UNIONTOWN RACE NOVEMBER 30

Uniontown, Pa., Oct. 23—Sanction has been granted by the American Automobile Assn. for two races to be held on the 1⅛-mile board speedway here on Thanksgiving day. The major race will be 112½ miles or 100 laps of the track and will be for cars of 300 cubic inch displacement or under. Prizes for this race will total $3,000, first place carrying $1,000.

Harkness Trophy List

Twenty-four Entries Have Been Made to Compete for $12,500 Purse

Prizes to Be Divided Among First Six Finishing 100-Mile Event

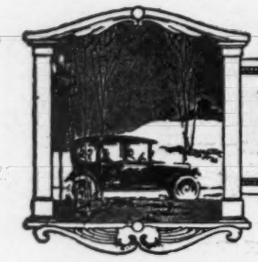
NEW YORK, Oct. 23—Twenty-four entries have been made to date for the 100-mile race for the Harkness Trophy at Sheepshead bay Speedway, October 28. This trophy was won last year by Resta in his Peugeot in 56:55:71 or at 105.39 m. p. h. As this is practically the final speedway event of the year, it is expected that the entry list will be a large one and will include all the drivers who have won places in this year's races. Entries will close tomorrow night.

There will be $12,500 in prizes, $10,000 of which will go to the first six cars to finish in the 100-mile race and $2,500 in lap prizes to the leaders of each lap after the tenth mile in a 50-mile special race for non-winners.

The list of entries to date follows:

CAR	DRIVER
Peugeot	De Palma
Peugeot	Resta
Peugeot	Aitken
Peugeot	Wilcox
Maxwell	Rickenbacher
Maxwell	Henderson
Premier	Galvin
Premier	Lewis
Duesenberg	Devlin
Duesenberg	Milton
Duesenberg	DeVore
Duesenberg	Buzane
Delage	Devigne
Delage	LeCain
Crawford	Klein
Crawford	Chandler
Crawford	D'Alene
Hoskins	Hughes
Hudson	Vail
Ogren	Burt
Ogren	Hemming
Adams	Adams
Benedict	Benedict
Weightman	Weightman

A British tank or armored and armed caterpillar in action on the Somme front in France. The view of the armored car itself is an actual photograph, made from the first negative of these cars to reach America. The setting is the work of Motor Age's artist, designed to show its appearance in action. Note that the left continuous track is broken, exposing the driving cogs behind the front trucks



EDITORIAL PERSPECTIVES

Traffic Regulation by States

MOVEMENTS for bringing about uniform traffic regulations would present an easier problem were it possible to get the various states to make rules governing the control traffic for a whole commonwealth, and if this were done the traffic regulations of our country would be put upon a uniform basis in a much shorter time than will be possible by taking up the solution with individual cities and towns. Getting at the fountainhead of things is the best method of procedure. Of course, there are certain rules now that have been made by the several legislatures, but these are at as great divergence as between states as are the rules laid down by the various cities. Probably federal control would be the ideal way if it could be considered constitutional and could be broad enough to allow for differences in local conditions.

WE can conceive how it would be possible for each state to draft a set of rules along the same fundamental lines which would be applicable to any city in the country. There are approximately 1,300 cities having a population of 10,000 in the United States. Imagine the work entailed in getting 1,300 municipalities working along the same lines as compared with forty-eight states. We do not mean to infer that each state could make rules that would cover every emergency arising in each of the cities within its borders, but each state could draft a set of regulations that would embrace the fundamentals of traffic handling and were this done, everyone in that particular state who operated a motor or horse-drawn vehicle would be put on the same basis so far as knowing what the rules were within his own state.

AS it is at present, there may be almost as many different angles to traffic movement in the cities of a state as there are cities. Gradually municipalities are coming to realize the necessity of uniformity in handling traffic. They are bending every energy to give their citizens the protection that is due them. It is a gigantic task and a worthy one, but inasmuch as prosecutions for personal injuries or fatalities come within the jurisdiction of state officials and inasmuch as the motor vehicles bring considerable revenue to the state treasury and since many phases of motoring are properly state problems, it seems that the regulation of traffic to bring about uniformity quite naturally is more of a question in which the state should have a hand than should each municipality. Such phases of traffic regulation as are common only to an individual city might be regulated by city ordinance even with the state as the father of the fundamental principles of the traffic rules under which the city operates.

Criminal Negligence

AN accident this week, in which a limousine with its seven passengers plunged through the open draw of an unguarded bridge on one of the principal streets in Chicago, resulting in the drowning of five passengers, only serves to emphasize the need of proper and thorough protection to motorists at such points. With the bridge open to allow the passage of a tug and its convoy, with no light or watchman, reliance was placed upon an electric alarm bell which was supposed to ring automatically during the time the bridge was open. It seems the automatic bell failed to ring in this particular instance and there was no indication to traffic that the way was not clear. Such negligence on the part of the city authorities is criminal.

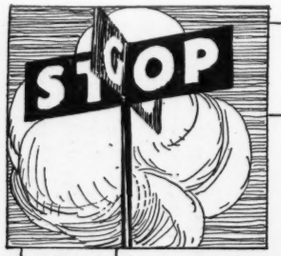
CHICAGO is not the only city with unguarded draws that have been responsible for accidents and deaths to motorists and other users of the streets and boulevards. In the one city, however, ten vehicles have gone through open draws and twenty people have been drowned and double that many injured in the past 12 years. It is only a simple and inexpensive feature of safety first to guard draw bridges properly when they are open.

Short Fuel Measure

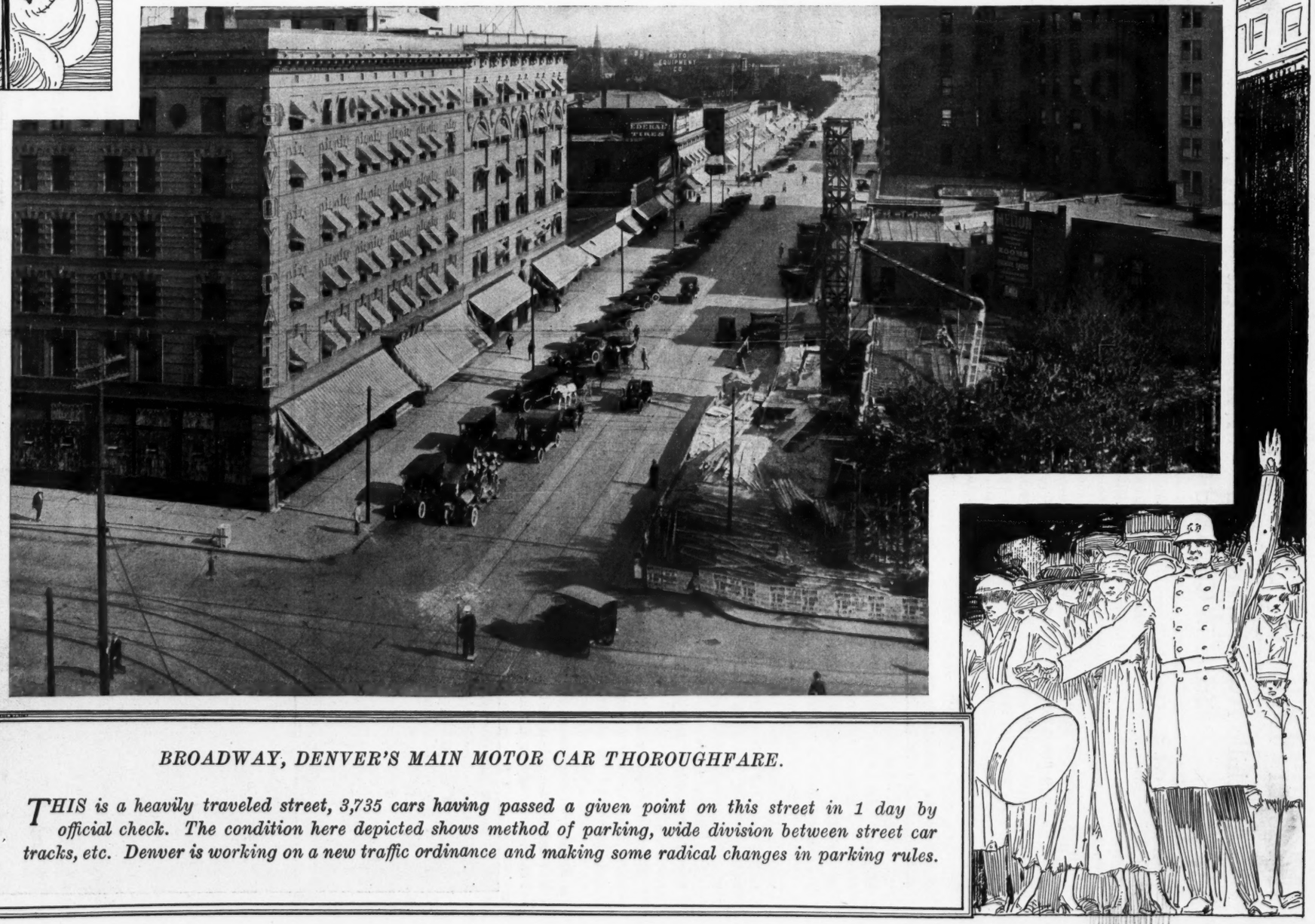
IN the agitation over the high price of gasoline which has been at fever heat for a year or more, motorists have lost sight until the last week or two of one chief cause of the high cost of fuel per mile. This cause is one which perhaps has been in existence for several years but now is more a factor than ever before. Possibly it has occurred to very few of us until recently that it might be advantageous to keep a close track of the amount of gasoline we were actually receiving for our gallon when it was furnished from the roadside or garage fuel distribution plant. Nevertheless, the motoring world has awakened within the past week or two to a very serious consideration of this question. It was brought about chiefly through the report of the Bureau of Standards of the Department of Commerce and was then taken up by the different state organizations and municipal governments.

THERE is little doubt that in many instances garagemen and dealers in gasoline are to blame for the short measure that they give purchasers of gasoline at their establishments. Nevertheless, it must be borne in mind that the vendor of the gasoline is not always wholly to blame. The chief cause, or one of them, is the slow pumping by which there is leakage of gasoline past the pump valve, leakage of air into the gasoline, so that the whole quantity of gasoline which the pump should take at a stroke is not delivered into the hose, and thus into the motorist's tank. In many cars, the tank filler is not sufficiently large or is not the proper shape to permit the tank to be operated at its greatest speed, that is, its normal capacity, and consequently the construction of the car itself will not permit a full quantity of fuel to be delivered from some types of delivery apparatus.

THE more rapidly the gasoline can be delivered from the pump to the tank—that means, the larger the hose and nozzle can be and the larger the tank filler on the car can be—the less loss there will be to the motorist. Car manufacturers can assist still further in cutting down the fuel cost by increasing the size of, and re-arranging their filler pipe in many instances, and this is a factor which is susceptible of immediate remedy. As to the other factors, it is up to the gasoline pump makers and also is up to the honesty of garagemen and strict inspection by the proper authorities. It is as important to the motorist as other short weight inspections in other lines.



Great American Thoroughfares



BROADWAY, DENVER'S MAIN MOTOR CAR THOROUGHFARE.

THIS is a heavily traveled street, 3,735 cars having passed a given point on this street in 1 day by official check. The condition here depicted shows method of parking, wide division between street car tracks, etc. Denver is working on a new traffic ordinance and making some radical changes in parking rules.

Master Drivers Get Stuck in Mud

Al Schillo Awarded First Prize—Makes Perfect Score in Curtailed Grind

CHICAGO, Oct. 20—The second annual Master Drivers' run for the title of Master Driver of the Chicago Automobile Club, which started here Thursday, was halted at Peoria this morning after having completed only one day of the 3-day drive. It was scheduled to end at Chicago Saturday. Al Schillo, at the wheel of a Mercer, was the only one of six starters to reach Peoria with a perfect score and consequently he gained the award of Master Driver title and the gold medal, which was offered to the winner by Barney Oldfield and inscribed "To the Master Driver of the Chicago Automobile Club from the Master Driver of the World. William Robbins, in a Mercer, had the lowest number of penalties and wins second prize, while John Kersher, in a Jeffery, took third.

E. A. Turner, who won the title last year in a Mercer, took fourth in the curtailed event of this year, driving a Hupmobile. B. B. Ayres, in a Scripps-Booth, broke a spring in such a way that it was impossible to finish the day's race and W. M. Gelderman ditched his Pathfinder for the night.

Road and weather conditions of the very worst kind made it necessary for the officials to curtail the event, so that instead of the 500-mile 3-day run from Chicago to Peoria, to Davenport, Ia., to Clinton, Ia., and return to Chicago, the 196 miles to Peoria probably will be considered the complete contest, although the referee and judges have not yet announced such a decision.

Thursday's run to Peoria was over dirt roads most of the way and these had been turned into a sea of mud by the steady downpour of the night previous and kept getting worse as the tour progressed, due to the continued rain Thursday. The clay hills and deep mud required low-gear work from many of the cars a considerable portion of the time, and the water and mud caused ignition and carbureter troubles as well as difficulty in keeping up with the 20-mile schedule set.

Friday morning the tourists started out from Peoria on their 180-mile run to Clinton in the face of a driving blizzard of sleet and snow, such that the danger in driving was considered too great by the officials and the contestants were called back after they had proceeded only a few miles. Most of the drivers came in by train shipping their cars later. John Kercher's Jeffery and the Elgin, an official car, were driven back to Chicago making the distance in 2 days.

Rules for the contest were somewhat changed as compared with those of last year and seemed to work out, in general, better than did the original ones. The object of the contest was to determine the best driver of the club, and any member of the club was eligible and could drive any car he desired, whether it were his own or not. The rules in general were based on those of the American Automobile Association for its Grade 3 reliability contests, but were altered in a number of respects. In the first place, penalties were assessed for tire changes. These penalties were based on the age of the tire. Penalties were assessed for stopping the car between controls except such as necessitated by railroad crossings in the country or traffic regulations in town. Another penalty was assessed for striking persons or domestic animals or fowls on the road.

No route matter was provided and no confetti was thrown, the contestants simply being given the noon and night controls, the distances between them, and two intermediate points through which they must pass and at which they were checked. They were also given the average miles per hour they should make and the time they were due at the noon and night controls. They then had to check in at the intermediate controls on time as well, having a leeway of 10 minutes.

The one new rule which did not work out well was that of limiting the number of miles which could be traveled between controls, penalties being assessed under the rules if the total distance covered between controls as shown by the odometers, exceeded the usual distances plus an allowance for detours. Odometers were checked by the Stewart-Warner company before the start. However, this rule had to be abrogated because the very slick roads and the skidding made both front wheel and transmission driven speedometers anything but accurate. Summaries of the results follow:

SUMMARIES

First prize, Al Schillo, Mercer, perfect score.

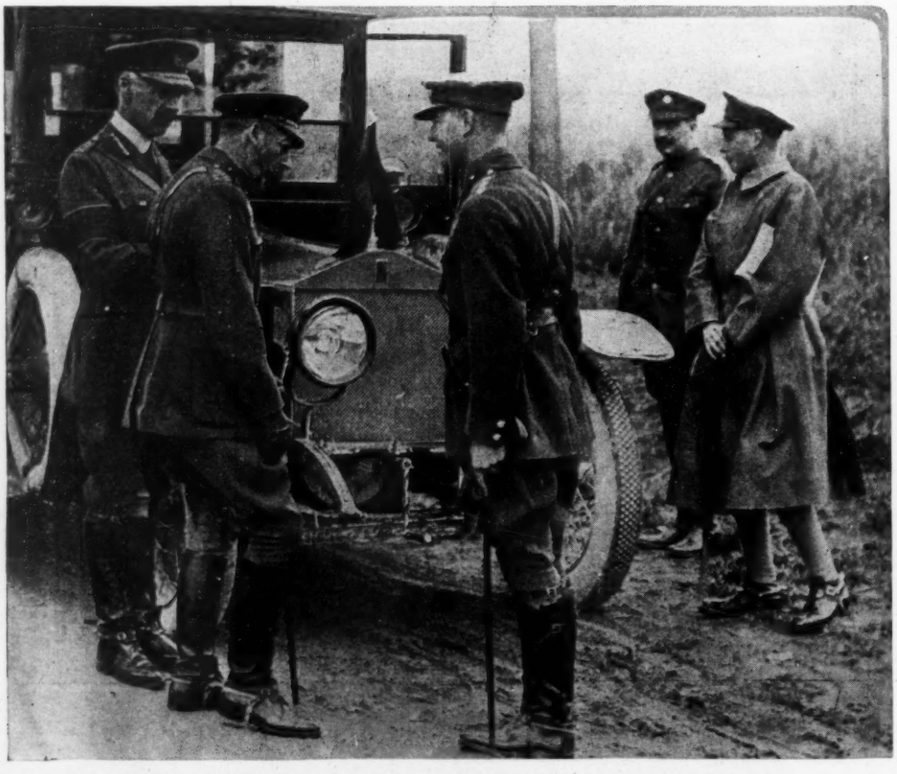
Second prize, William Robbins, Mercer, 124 points penalty for lateness at controls and tire change.

Third prize, John Kercher, Jeffery, 129 points penalty for stopping car and lateness at control.

Fourth place, E. A. Turner, Hupmobile, no prize, 180 points penalty for being late at control, work on ignition and gasoline system, taking on supplies outside of controls and hitting a chicken on the road.

William M. Gelderman, pathfinder, 1,006 points penalty, over 3 hours' late at night control.

B. B. Ayers, Scripps-Booth, 1000 points penalty, over 3 hours' late at night control.



England's monarch and his heir, the Prince of Wales, somewhere in France

A Correction

Chicago, Oct. 23—In the October 12 issue of Motor Age was given a list of the exhibitors at the New York and Chicago shows and through error the Elkhart Carriage & Motor Car Co., was omitted. This concern drew space C-20 for New York. The Westcott Motor Car Co., Springfield, O., will exhibit at Chicago.

EIGHT ENTRIES FOR VANDERBILT

Los Angeles, Cal., Oct. 21—The formal closing of the entries for the Vanderbilt Cup and International Grand Prize races on the Santa Monica course November 16 and 18, was Wednesday, October 11. Only eight entries had been received at that time. Entries may be made until noon,

November 11 by the payment of an additional $100. All entry fees are to be returned to starters, so the prospect of the extra $100 need cause no worry. The lack of entries at this time is ascribed by the promoters of the races to the fact owners and drivers do not care to declare themselves until after the close of the eastern season. Some drivers also are holding out for expense money, it is said. The eight entries now in are five Mercers with Pullen, Ruckstell and Thomas, as three of the drivers; Earl Cooper, Stutz; Barney Oldfield, car unnamed; Clyde Rhodes, Hudson.

There is a possibility that neither the Vanderbilt cup nor the grand prize will be run as there is talk of protest against using a part of the road embodied in the present course.

ASCOT MEET CHAMPIONSHIP CONTEST

Los Angeles, Cal., Oct. 21—The prospect of winning 700 points in the national championship award, not to mention the $5,000 in prize money, is expected to lure the best racing drivers in the country to Ascot park, Thanksgiving day. This 200-mile championship sweepstakes is the last event of the year that will be considered in the national A. A. A. award to determine the premier racing driver of the year. Work on the construction of the new bleachers has begun. The track has had almost 6 months in which to season and is said to be in excellent shape.

GETS MAXWELL-BRISCOE PARTS

Newcastle, Ind., Oct. 23—The Newcastle Auto Parts Co. was sold last week to the Standard Motor Parts Co., of this city. The latter company took over more than $3,000, worth of obsolete Maxwell-Briscoe and Everett parts. The Newcastle Auto Parts Co. was incorporated only 2 weeks ago with a capitalization of $200,000, and at the time of its organization announced it would occupy 20,000 square feet of floor space in the Maxwell plant in the manufacture of parts, accessories and appliances for cars.

SPEEDWAY MEN TO MEET

Chicago, Oct. 21—At a dinner given by C. H. Weihe, of the Chicago speedway, recently, plans were laid for a formal meeting of the representatives of the speedways throughout the country at the time of the Harkness trophy race in New York, October 28. No definite action was taken at the dinner as Chairman Thompson was not present, but permanent officers probably will be elected at the New York meeting. Three speedways were represented. Harry Leyman, of Cincinnati, of the Cincinnati track; T. E. Myers, of Indianapolis; David F. Reid, F. H. Foster, George H. Shanks, Edward Hines, and C. H. Weihe, of the Chicago track. Richard Kenderdall, of the contest board of the A. A. A., and C. G. Sinsabaugh, of New York, were also attendants at the dinner.

Los Angeles Show Comprehensive

Effort Will Be Made to Equal Big Eastern Exhibits—Opens Saturday

LOS ANGELES, Cal., Oct. 21—With applications made for 56,420 square feet of exhibit space, sufficient to accommodate 227 motor vehicles, the motor show to be given in Los Angeles, October 28 to November 4, under the auspices of the Motor Car Dealers' Association is assured of being the greatest exposition of cars, motor trucks and accessories ever held in the west and ranking second in size and importance only to the national events at New York and Chicago.

Ninety-six dealers in motor vehicles and accessories have made application for exhibition space. The three-story building that was secured originally to house the show proved inadequate and an adjoining vacant lot was rented. Even this was insufficient and then it was agreed to take another lot, across the street from the building and put the commercial vehicles there. The lots are to be covered with canvas. Some truck dealers who applied for space objected to their part of the exhibit being separated by the street, but it is not likely that any will refuse to show, because of the fact that the industry is alive with enthusiasm over the prospects.

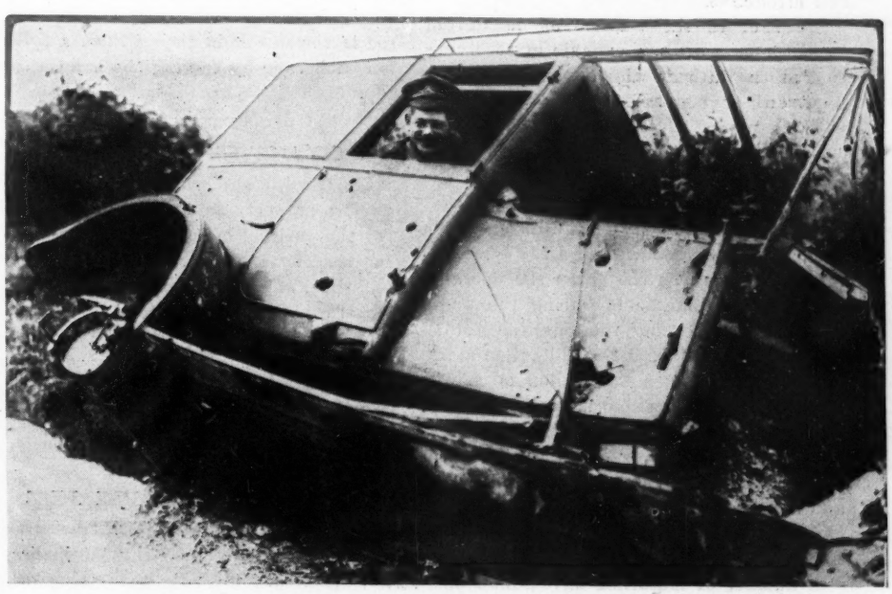
There will be several amusement features. Five orchestras have been engaged to furnish music. An opera company filling a theatrical engagement in the city and several footlight celebrities will contribute their efforts. The decorations will be unique and original. There will be plenty of color. Dealers have learned that somber hued cars fail to attract at events of this kind so special paint jobs will predominate. The victoria top will have its inning and special seat covers in heavy cretonne and tapestry will add to the variety to be found at the show.

ARRANGE FOR KEROSENE USE

Chicago, Oct. 23—Independent oil men are arranging to appoint in each large city a repair man to convert existing motor cars into kerosene cars and may even finance the repair shop for the purpose. This is the outcome of a resolution adopted by the Independent Oil Men's Association during its convention here last week, and is the result of a report of a committee appointed last April known as the gasoline relief committee and consisting of Professor Lucke, head of engineering department of Columbia university, Professor Metzler of the same institution, and M. J. Byrne, Waterbury, Conn.

This committee came out very strongly on kerosene as the most favorable present solution, stating that it was its opinion kerosene offers the most hopeful fuel supply for motor use. It has examined a large number of devices and has recommended two specifically. One is the invention of John Good, and the other a device owned by the Holley Bros. Co., of Detroit.

The convention, which is the eigth annual, was the best the oilmen have had, there being over 800 present and papers of great interest to motorists were presented. Excerpts from these papers will appear in the next issue of Motor Age.



Motor car that has run into the range of fire on the western French front. The armored tanks seem to be about the only type of motors that can amble about as they please on the firing line. The smaller car shown in photo certainly came to grief. The chauffeur seems pleased with it all, however

Slow Pumping Gives Short Measure

SINCE the publication last week that inspectors of gasoline pumping stations had found serious shortage in the measures given motorists buying from these pumping stations in different centers throughout the country, a number of explanations have been brought forward. As reported in Motor Age last week, the Bureau of Standards of the Department of Commerce has stated that the principal causes of short delivery from gasoline pumping stations are the leaks in the valve and piping; the formation of vapor due to excessive suction lift; the introduction of air under the pistons; failure to correct for the inertia of a long column of moving liquid; the use of long filling hoses with low connection at the pump, making improper drainage of the hose an impossibility; operation of pump at less than full stroke; and slippage past valves and pistons. In Chicago it was found by Federal inspectors and state inspectors, that the average shortage was 3.9 cubic inches per gallon in Chicago and 7 inches per gallon in other parts of the state of Illinois. It is quite possible that these figures of the extent of the loss to motorists in Illinois and similar figures in other states are lower than the actual loss, but the loss is of much import.

Inspectors Are Misled

In supporting this statement, it has been hinted that the inspectors themselves have been fooled in a number of instances as to the actual delivery of the pump. This comes about through the methods of operating the pump by giving a complete hard, full stroke when the pump is being inspected for delivery and filling motorists' gasoline tanks by a slow and perhaps not full stroke.

Many of the tank fillers as now fitted to motor cars are not capable of receiving fuel at the rate at which it would be delivered if a good rapid stroke were made with the pump. Quite frequently it is necessary that the pump be worked slowly in order to prevent it running over at the filler.

Many of the pumps at the filling stations are operated by compressed air. When the inspector examines the pump the operator may pull the handle operating the pump heavily, thus forcing the gasoline out as speedily as possible, and a full gallon measurement or nearly a full gallon is the result; but when the pump is operating slowly as it may be when filling the motorists' fuel tank, the compressed air is allowed to seep through the valve with the gasoline, and the result is that the motorist may purchase a rather considerable fraction of air in the gasoline.

A number of motorists have taken upon themselves to make independent investigations of the gasoline measure problem. One of these is Harry N. Fowler, of the Fowler Lamp Co., Chicago. He has arrived at the suggestion of a standard weight measure instead of the cubic capacity or gallon measure, or else a standard receptacle. In advocating the standard weight measure he claims that the difference in weight of different grades of fuel will be very slight inasmuch as between gasoline of the present day and kerosene there is a difference in weight of less than 2 per cent.

SHORT MEASURE IN DETROIT

Detroit, Oct. 20—Many of the gasoline pumps in Detroit are defective and few can be regulated to keep an accurate standard, according to the city sealer of weights and measures. A system has been tried consisting of placing metal tag seals on adjustment screws, and has been discontinued since the department discovered that the pumps often became inaccurate, despite the seal, and that many dealers claimed immunity in consequence of the fact that the seal was untouched while the pumps gave a short measure.

Owing to the rapid growth of Detroit and the small number of men used in making inspections prosecutions of short measure gasoline pumps have been few, but attempts to keep them up to standard by a constant supervision of them and by forcing dealers to make weekly measurements and inspections themselves.

A great part of the short measure is found to be the result of loose valves, dirt beneath the valve seats and to the long hose connections which allow a quantity of gasoline to remain in the hose, thus cheating the motorist even when a full measure has been pumped.

It also is pointed out that 90 per cent of motorists are extremely careless when they purchase gasoline and do not watch to see if the dealer is giving them a full gallon each time by forcing the handle to the top.

CITY GIVES PARKING SPACE

Hartford, Conn., Oct. 21—Setting aside vacant property in the downtown district for the parking of motor cars is a plan being used by a number of cities at the present time, one of the latest to do this being Hartford, Conn. Some land owned by the city only a half block from the main street, has been made into a parking station and the city contemplates razing some old buildings on a part of its property to make more parking space.

LIMIT STRAIGHT-SIDE SIZES

Washington, D. C., Oct. 20—Straight-side tires, larger than 36 by 4½ inches, are not practical and straight-side tires smaller than 32 by 3½ inches are unnecessary as smaller ones are for Fords and therefore are the soft-bead clinchers. This fact was brought out at the meeting of the standards committee of the Society of Automobile Engineers at the Bureau of Standards Wednesday, at which several new standards were adopted by the committee for presentation to the society for mail vote. The tire division recommended straight-side tires from 32 by 3½ inches to the 36 by 4½ and the recommendation was adopted. The proposed standard car performance test, which one division of the committee has been working on, is not complete yet but will be final in January.

The tentative military truck specifications which the War Department has asked the S. A. E. to develop were literally torn to shreds as to detail. One of the suggestions was a tread to fit railroad tracks since many of the military trucks will run on rails.

TO RELIEVE CAR SHORTAGE

Detroit, Mich., Oct. 23—Railroads are becoming active in their appeals to shippers to aid in abating freight car shortage which is now causing many car manufacturers to cut down production. Paul King, receiver for the Pere Marquette, has pointed out to shippers that the only immediate remedy lies in prompt loading and unloading of cars. Mr. King attributes the shortage to the great volume of freight and declares that this has forced a number of embargoes.

Resolutions were passed at a lumbermen's convention in Memphis on October 21 which favored adoption of the proposed increased demurrage charges as recently announced by railroads and a reciprocal arrangement was demanded by which railroads would be penalized for failure to provide freight cars as requisitioned.

CHAUFFEUR FORFEITS LICENSE

Columbia, Mo., Oct. 21—Chauffeurs who are also speeders well may look to Missouri and take warning, since that state, true to form, has shown them what their ignoble end may be by revoking the license of one of its chauffeurs. The motor vehicle act has been on the Missouri statute books 5 years, and during all that time no other case of the kind has been brought under this ruling.

Ora Mann, Columbia, Mo., is the first person in Missouri to suffer the loss of his chauffeur's license from the inforcement of the motor vehicle act of 1911. He had been arrested three times for speeding before and had been let off with small fines. However, even the most lenient judge of a speeder's court cannot be lenient always, and when he appeared to answer the charge of reckless driving for the fourth time recently, not only was a heavier fine judged against him, but his case was reported to the secretary of state and his license was taken away.

Overland Administration Building Unique

The new modern office building of the Willys-Overland Co. which has just been occupied. This seven-story structure fronts on a boulevard which separates it from the factory. Behind it is the beautiful Willys Park, named in honor of John N. Willys, president of the Willys-Overland Co., by the city of Toledo, O.

TOLEDO, O., Oct. 14—The Willys-Overland Co. has just moved into its new administration building, which is one of the finest office buildings connected with the motor car industry. It is a seven-story brick structure, 375 by 60 feet, housing a working force of 950 people. All of the administrative offices in connection with the factory are located in it. It is an architectural model to the industry and well adapted for the work.

More Like Hotel

On entering the building the atmosphere is more that of a huge hotel than an executive building for a motor car concern. On the ground floor is a reception room 100 by 30 feet, resembling the corridor of a large hotel. It is filled with large couches, divans, chairs, etc., and fronting on one side of it are the elevators. The building is served by a system of four Otis passenger elevators, each with a capacity of twenty people, in addition to which is a 5,000-pound freight elevator.

The building is of steel construction with an Equitable brick exterior, giving a most attractive appearance. It is located directly across the factory from the old offices, fronts on the city boulevard and faces what is known as the Model 75 building, that is, the huge assembly building, 1,000 feet in length, in which Model 75 is built.

The general layout of the administration building has been worked out with economy in every feature as a foremost requisite. Those departments such as purchasing, service, and traffic are on the main floor, so that the elevator service is not called upon to serve them. These are the departments that have most business visits from outsiders per day.

The second floor is given over entirely to accounting. In it steel furniture is used throughout. Each clerk sits at a steel table and back of it is a steel cabinet, a little higher than the table, in which all of the books, etc., are kept.

The third floor may be described as the middle floor of the building, there are three below it, counting the basement, which is a ground level floor and three above it. On this middle floor are the central correspondence files for the entire building; the force of forty or more stenographers occupies a department of this floor; the women's rest room, with a graduate nurse attendant, is located here; and other hospital arrangements are on this floor. It is most convenient, being half way up and down, for the stenographic force which goes up or down to the different offices as required, also for filing, etc.

The fourth floor, that is the first above the central one, is given over entirely to sales departments, including separate offices for all the departments of sales.

Fifth floor is devoted exclusively to offices of the executives of the firm and board rooms. On this floor the office of President John Willys is finished in walnut, and is a model of its kind. The board room, similarly finished, has paneled walnut walls, and the customary ponderous table extending from end to end, which carries the atmosphere of a bank board room. All of the vice-presidents and other officers have offices on this floor.

Cafeteria on Top Floor

The sixth, or top floor, is a huge cafeteria, with capacity for 200 persons every 30 minutes. This cafeteria occupies but one-half the floor, the other half being a large auditorium with seating capacity for 600, a stage at one end for moving picture programs, and a dancing floor. The cafeteria has been carefully worked out so as to give efficiency. The luncheon hour ranges from 11:30 to 2 o'clock. It is handled in 30-minute relays. One division of the office takes luncheon 11:30 to 12:30; another 12 to 1; another 12:30 to 1:30; and the fourth 1 to 2. Luncheon prices are very low. The prices are: Meat order, 9 cents; soups, 5 cents; vegetables, 4 cents; dessert, 5 cents; coffee, milk or tea, 3 cents. Coupon books worth $2 are used in payment.

The basement floor contains lockers, stock room—mail receiving department, etc.

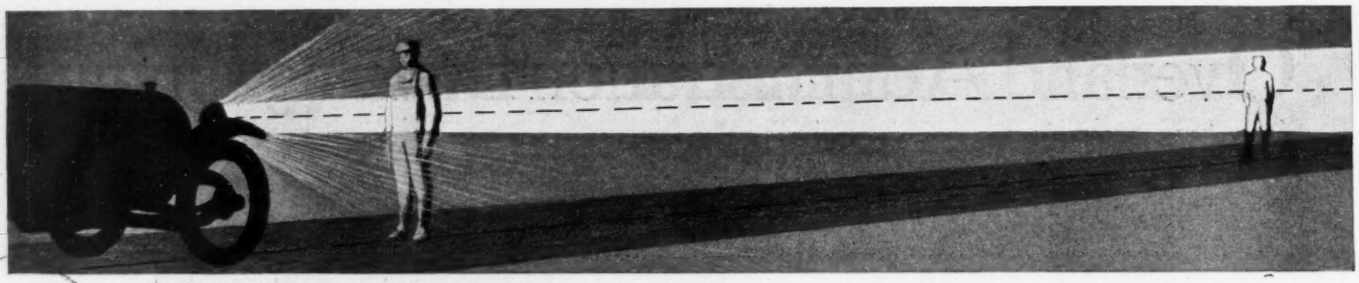


Fig. 1—Diagram of the light cast by a good lamp, the direct rays from the bulb furnishing adequate illumination without glaring to the eyes outside the limits inclosed by the heavy lines

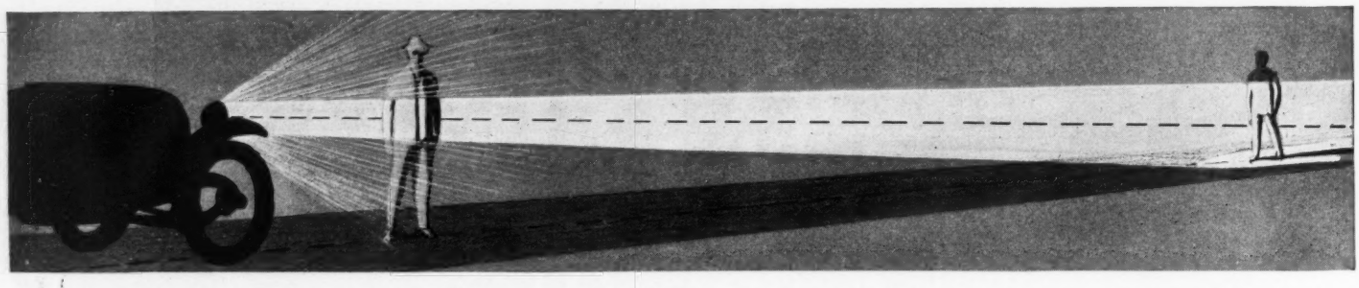


Fig. 2—Tilting the lamp downward so that the edge of the beam, instead of its center line, is parallel to the ground, eliminates glare

Preventing Headlight Glare

What Causes Dazzle and How to Eliminate It— The Manufacturer's Part

NEW YORK, Oct. 24—For a year and more the Society of Automobile Engineers has been trying to solve the question of headlamp glare, examining the subject in a scientific way, and it has made such great progress that a final report will soon be forthcoming and it is hoped the problem will be solved.

Headlight glare has been a far more difficult matter than might appear. Essentially the problem is to get enough light where it is wanted and to prevent too much going where it is not wanted. We must use our cars at night and to do so safely we must be able to see things on the road. Now to see a man 150 feet ahead of the car means that there must be a strong enough light falling on that man to make him visible 150 feet away. The only way to illuminate him is to carry a light on the car which will reach 150 feet, and the possession of such a light is the first condition for safety.

Conditions for Safety

The second condition for safety is that the light must not dazzle the man, or else he will be unable to see anything except the approaching lamp. Now, a light strong enough to make a man visible at 150 feet will also be strong enough to dazzle him if it shines directly into his eyes. Therefore it must not shine in his eyes and it must shine upon the rest of him.

This means we must have a strong light on the road and as little light as possible at a height of a few feet off the road.

To define the proper light the S. A. E. has to decide just how strong a beam is necessary to insure that a man 150 or 200 feet away will be seen by the driver, and it also has to determine how high the light may be allowed to rise above the road without dazzling people approaching the car.

At the present moment we can prevent headlights from glaring badly by just tilting them downwards, but we may find when we have done so that the light 150 feet away is hardly strong enough. Unfortunately the black roads of the modern type make necessary much more light than the old white ones, as the beam of light is simply absorbed when it hits a black road, instead of being reflected.

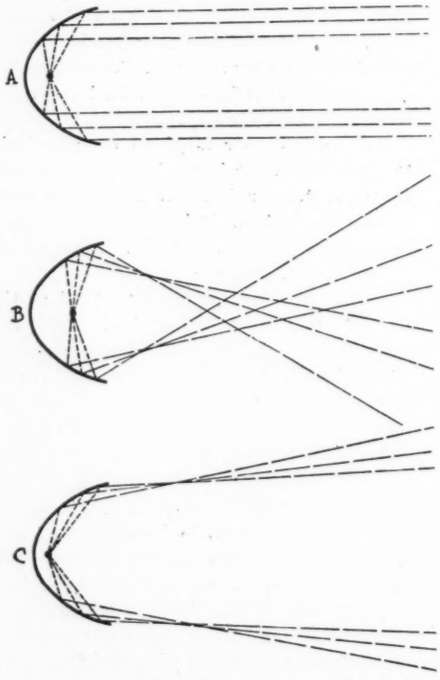


Fig. 3—The same lamp as considered in Figs. 1 and 2 with the same setting and the light it will give when the bulb is moved so as to put the filament in a different position

Of course, we can cure glare by merely reducing the light, but we cannot possibly have a headlight that will give enough light at 150 feet which will not glare if the beam is so directed that it goes into the eyes of anyone on the road. As long as it does not reach the eyes of other people, the more light we can have, within limits, the better it is for everyone. It is easy to prove this by getting up on a bridge across a country road. Looking down from above like this it will be noticed that the lights of approaching cars hardly ever glare and that the powerful ones enable much more to be seen on the road.

At present what has been found out can be summed up as follows:

A headlamp of a motor car will give an adequate light combined with elimination of glare when:

Summary of Proper light

1. The light is sufficient to reveal any person, vehicle or substantial object on the road straight ahead at a distance of 150 feet.

2. There is sufficient side illumination to reveal any person, vehicle or substan-

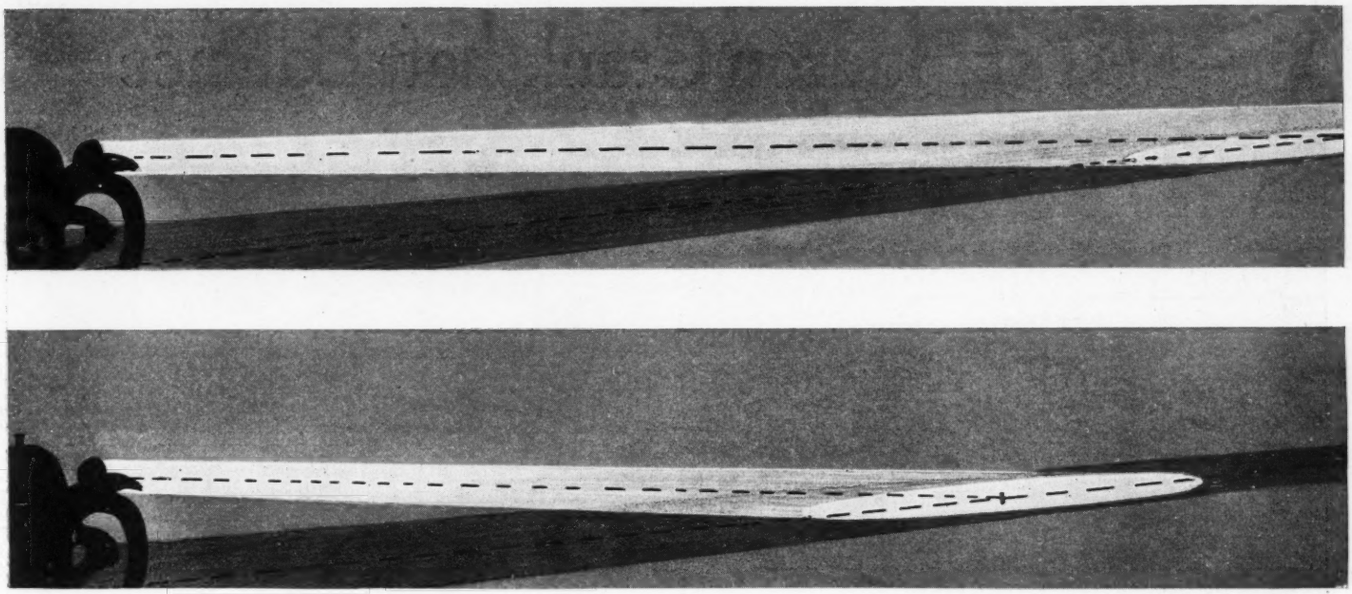


Fig. 4—Exaggerated diagrams showing the effect of tilting the lamp so that its rays hit the ground too quickly

tial object 10 feet ahead of and 10 feet to one side of the lamp.

3. The headlamp is so arranged that no portion of the reflected beam of light, when measured 75 feet or more than 75 feet ahead of the lamp shall rise above 42 inches above the level surface on which the vehicle stands.

This is the ideal, and it is attainable by limiting the tolerances in bulb manufacture, limiting the form and the degree of inaccuracy of the reflector and, finally, by tilting the lamp.

This is all very well as far as it goes, but it does not go far enough. It is essential to find out how much light is "sufficient" to find out what candlepower of light we want on the road at 200 feet, how much candlepower 10 feet to one side and so on. Also we must know how deep the reflector has to be to permit the elimination of focusing and how accurate it must be to allow us to have a beam of light that can be definitely kept from rising too high. It is on details such as this that the S. A. E. is working, and the precise answers will be given before long.

How a Good Lamp Acts

Fig. 1 is a diagram of the light cast by a good lamp. The direct light from the bulb illuminates objects surrounding the lamp and close to it just as though the reflector was not there. The concentrated light or the beam of light cast by the reflector does not touch the road for some distance, not till the beam has spread out. The edges of the concentrated beam are shown by heavy lines, and the center line of the beam by a dotted line. The lamp will not glare to anyone whose eye is outside the limits inclosed by the heavy lines.

With the lamp placed square to the car this means that a pedestrian will not notice any glare when the car is close to him, but he will notice it when the man B is unable to see anything except the lamp and suffers extremely. This is because the upper edge of the beam is not as high as A's eyes but is higher than B's.

All we need to do then, is to so set the lamp, or so construct it that the upper edge of the beam cannot ever rise as high as a man's eyes however far away he may be.

Therefore, if we tilt the lamp downward as in Fig. 2, so that the edge of the beam is parallel to the ground instead of the center line of the beam, we have cured that lamp of glaring so far as any approaching pedestrian or driver is concerned.

Headlights Cast Iregular Beams

This seems too absurdly simple to be true. It is true enough though if we have a lamp that really does give a beam with a sharp edge. The bulk of the trouble with headlamps is that they cast irregular beams and it is the purpose of the Society of Automobile Engineers to define limits for lamp manufacture that will make the beam sufficiently accurate to enable simple lamp adjustments to give the upper edge of the beam its proper position without uncertainty.

The lamps, as made today, are not reliable, because while any one lamp may be set to give the correct light distribution with one bulb, when the bulb is changed the light may alter altogether. This is because the position of the beam changes as the filament of the lamp is moved.

Fig. 3 shows the same lamp with the same setting and the sort of light it will give when the bulb is moved so as to put the filament into different positions. At A we have the right spread of light. At B the filament is too far forward and at C it is too far back, the result in either case being to widen the beam so that it is no longer within safe limits; thus converting a non-glaring lamp into one which will glare very badly.

The average man is so helpless when it comes to focusing that he would be better off almost without any focusing device whatever, for he then would not maladjust a good lamp which he is likely to do if the chance is given him.

Next comes the reflector itself. If this is pressed accurately to shape the beam of light will be true and accurate, but if the reflector is irregular, of one curvature at one place and another somewhere else, then the beam will throw out odd rays of glaring light. This means that limits of accuracy should be imposed upon reflectors.

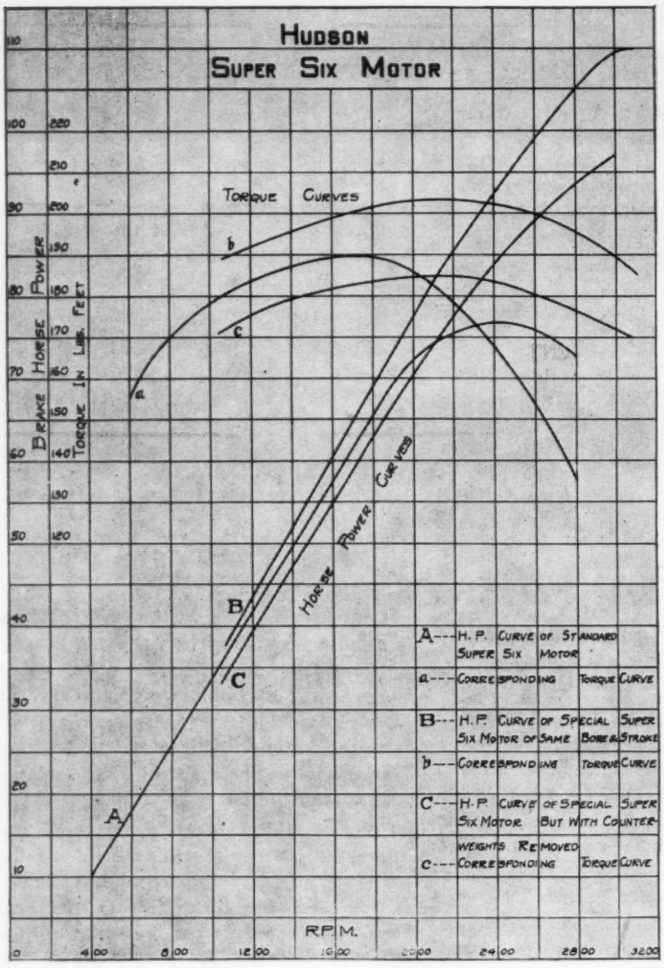
Another thing about reflectors is the kind of curvature they have. If a reflector is very deep, then moving the filament of the lamp has less effect on the beam than when the reflector is shallow. Some of the reflectors in use today are so shallow that even an expert in a laboratory has difficulty in adjusting the bulb so as to get a proper beam.

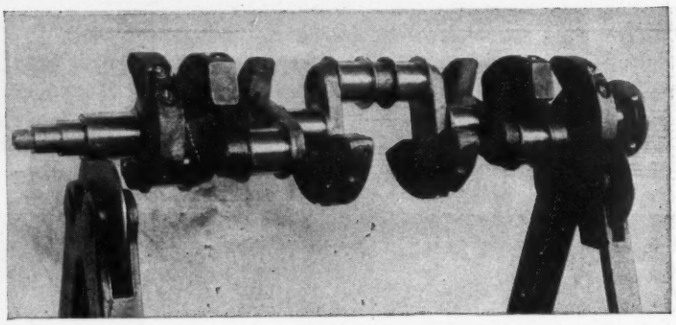
Tilting Reduces Light

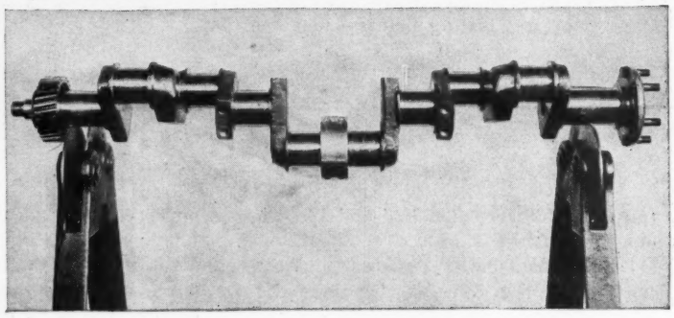
It was said above that tilting the lamp may be found to cut down the light and why this is can be seen in Fig. 4 which is an exaggerated diagram of the effect of tilting. With the parallel set lamp the beam strikes the road a long way ahead, when we tilt the lamp it hits the ground soon, and after the beam has hit the ground it is used up, it is no longer of much use. The middle of the beam is its brightest part, so we want to have the middle line hit the road as far ahead as we can.

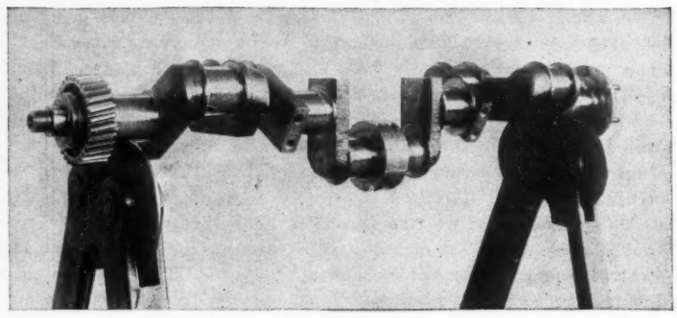
Suppose we want to have it hit the road 200 feet away and are compelled to tilt the lamp so that it strikes the ground at 150 feet, then to get the same light on the road we must increase the brilliancy so that the ray which does strike the road at 200 feet with the tilted lamp is as bright as the middle ray of the untilted one. There are ways of overcoming this, but most of them are patented at present. So the simple thing to do is to put up with the loss of efficiency temporarily and leave it to the manufacturers to work it out for themselves.

Test of Hudson Crankshaft Balance









At left—Horsepower and torque curves of the Hudson standard and special super six motors with and without counterweights on crankshaft. At right, above—Crankshaft with the Hudson patent system of counterweights on the balancing rack. Center—Crankshaft with counterweights removed, illustrating condition of static balance; note knife-blade static balance rack. Below—Crankshaft without counterweights placed on knife-blade static balance machine

Value of Counterweights in Super-Six Demonstrated—High Speed Shown Impossible without Balancing

DETROIT, Oct. 12—The value of the Hudson counterbalanced crankshaft was demonstrated here in a laboratory test which is unique in factory practice. A super-six Hudson motor was arranged to increase its power output by lightening the reciprocating parts, increasing the valve size, fitting magnalite pistons, two carbureters, and increasing valve spring tension, etc. A crankshaft in which the counterweights were readily removable was then fitted and the motor put on the testing block.

Power Curve Made

A power curve run was first made in which readings were taken every 3 minutes, with the result that the motor developed 110 horsepower at 3,100 revolutions per minute. The curve obtained on this run in which the crankshaft was provided with the counterweights is shown in the accompanying illustration.

After the power curve was obtained a re-adjustment of the connecting rod bearings was made and the next run was in the nature of an endurance test in which the motor speed was maintained at 3,000 revolutions per minute for 40 minutes. During this period the highest speed was 3,075 revolutions per minute and the lowest 2,940, the average over the entire 40 minutes being 3,055 revolutions per minute. The horsepower varied between 100.45 and 103.52.

When the 40 minutes run had been completed the bottom of the crankcase was dropped and the weights on the crankshaft removed. The counterweights had been arranged with cap screws so that they could be readily removed for the purposes of the test. After the weights had been removed a ring was fitted and a steel plug through the center throw in order to bring the shaft into perfect static balance. With the ring and the plug, the shaft is an exact duplicate of the type used in a very prominent six cylinder stock car.

Motor Put on Block

The motor was then placed on the block again and another power curve set of readings taken in accordance with S. A. E. standard requirements of 3 minutes run at each reading. It will be noted by the accompanying power curve C, that the output was considerably below that both the standard motor at low speeds and the special motor at all speeds.

The final test, however, came when the engine was started on an endurance run

without the counterweights at 3,000 revolutions per minute. Just 2 minutes, 30 seconds after the engine was started on this a change in the sound signified its impending failure and the next instant the lower end of number four connecting rod bearing shot through the crankcase, through the laboratory window and some distance across the street.

In all probability the main bearings were broken down slightly, first permitting a whip of the crankshaft which over-stressed the rod bearing. This was partially confirmed by a post-mortem examination of the motor. The shaft was also found to be sprung slightly which would further tend to confirm this theory.

One of the interesting points about the test was that the shaft with which the motor failed was considerably lighter than the counterweighted shaft, showing the relatively small importance of the rotative weights as far as power consumption is concerned, and the relatively high value that must be assigned to balance. The counterbalanced shaft weighs 30 pounds, 15 ounces more than the counterweighted.

Details of Change

The details of how the changes were made in the motor are of interest both from the standpoint of this test and from the fact that very much the same thing is done on the cars especially tuned up by the Hudson company for racing. Some of the differences are detailed as follows:

1. Valve lift increased from .3125 to .390 inch.
2. Valve diameter increased from $1\frac{15}{16}$ to $2\frac{1}{16}$, outside.
3. Valve weight, special motor, 6.48 ounces; standard, 5.52 ounces.
4. Valve tappets, special motor, 3.64 ounces; standard, 6.26 ounces.
5. Standard pistons cast iron, special, Magnalite.
6. Piston rings, standard, three; special, two.
7. Stock piston and rod assembly, 5 pounds, 13 ounces; special, 4 pounds, 12 ounces.
8. Lubricant used, castor oil.
9. Ignition, standard, except for double breaker arm.

MESCO REINCORPORATES

New York, Oct. 24—Special telegram—Manhattan Electrical Supply Co., Red Seal battery maker, has reincorporated with $1,500,000 capital to increase production. The old capital was $1,500,000. There is no change in officers who are: J. J. Gorman, president; B. H. Ellis, vice-president and treasurer. All first preferred sold stock on curb.

TAKES ROYAL EQUIPMENT

New York, Oct. 24—Special telegram—The Raybestos Co. has been incorporated with $1,500.000 capital to take over the Royal Equipment Co. There will be no change in policy or products. A 15-acre factory site has been purchased in Bridgeport and six new buildings will be erected, doubling the capacity.

FEAR U. S. A. CARS

London, Eng., Oct. 17—The recent announcement that the Ford company would establish a plant in England has brought forth proposals to boycott the low-priced American car. It has been suggested that all cars not manufactured in the allied countries be excluded from the British markets after the war.

The war has been the cause for great factory expansion and though the plants at present are busy on munition work and are well equipped with tools and appliances for taking care of a large production, the future use of these immense buildings has been a great source of worry to the country. The British motor car industry is particularly well equipped for rapid production, and so there seems no reason why it should not, in a very short time after the war, produce the desired cheap cars so as to repel the American invasion.

British makers hold that some such agreement should be reached on the ground that as soon as the war is over and freights drop to normal Europe stands a great chance of being flooded with cheap American cars.

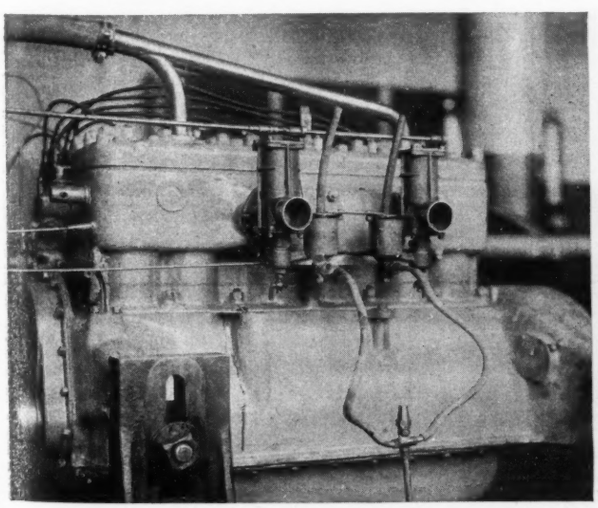
Up to the present time the British manufacturers have paid scant attention to the little car, for the reason that they have had more orders for their high-priced cars than they could execute. Conditions are changing, however, and the European trade is awakening to the possibilities of the low-priced car in that market.

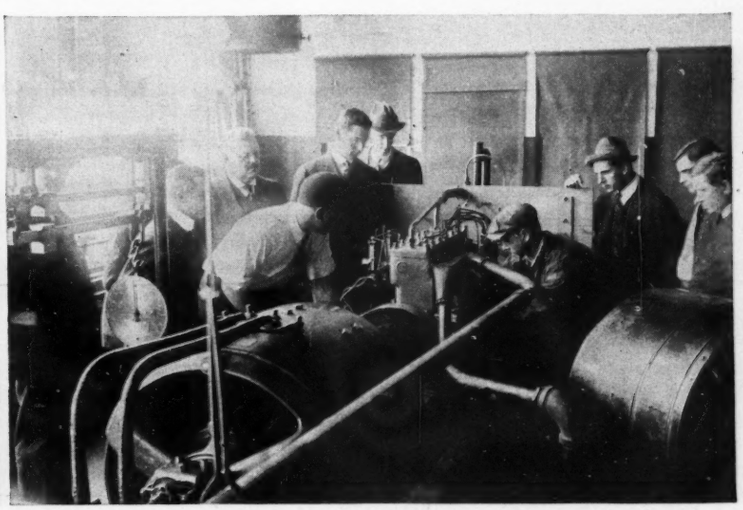
HARROUN CONTRACTS 5 YEARS

Detroit, Mich., Oct. 20—The Harroun Motors Corp. plans to make all contracts with dealers on a 5-year basis instead of the 1-year term now generally in use. The plan is to be operated because the Harroun company does not believe the short term system works to a fair advantage for dealers since a manufacturer is enabled to transfer his line with another dealer after 1 year and thus causes the original dealer to lose the efforts made toward the end of the year and all sales on parts for cars he sold.

WILL SUPPLY ELECTRICAL EQUIPMENT

New York, Oct. 21—The Wagner-Hoyt Electric Co. has been organized to supply car manufacturers with complete electrical equipment covering starting motors, generators, storage batteries, magnetos, battery ignition systems, switches, meters and lamps. The company owns and has pending many valuable patents and a license in the patents of the Ward Leonard Electric Co. It is believed that a company of this kind will find favor with motor car manufacturers inasmuch as the latter will be able to buy its entire electric equipment from one company rather than in buying it in separate units and then assembling it.





At left—Special super six motor arranged with two carbureters. Rubber tubes on carbureter float chambers to prevent pumping out of gasoline due to diaphragm action of float under vibration. At right—Hudson special super six motor on the dynamometer being made ready for horsepower test to accord with S. A. E. standard requirements

Refuse Touring Data

Believe Non-Members of Clubs Not Entitled to Service Belonging to Members

Bodies Unite to Curb Free Use of Information by Tourists

INDIANAPOLIS, Ind., Oct. 23—The Hoosier Motor Club is making an effort to get all clubs in the country to agree not to give touring information to any one who cannot show a membership card in some motor club. It gives as a reason that thousands of motorists who belong to no motor club at all tour the country and stop in every town asking the local motor club for road information and maps which they receive gratis.

The club points out that these motorists receive the same information and courtesy as extended to members of motor clubs who show their membership cards and declare that it is unfair to the members of other clubs and to its own members to make them pay for a touring bureau for the benefit of all motorists.

The plan the Hoosier club advances is that of giving members of motor clubs, either resident or non-resident, free touring information upon presentation of membership card. If a non-resident, non-member asks for information, it will be given and the club supplying such person with information, taking his name and address and forwarding it to the secretary of the motor club to which he should belong. Resident non-member to be refused touring information at any price except that of membership.

That this plan is bearing fruit is indicated by its adoption by the Automobile Club of St. Louis, Cleveland Automobile Club, Columbus Automobile Club, Columbus, Ohio, the Hoosier Motor Club, Indianapolis, and a number of others who have signified their willingness to any reasonable plan which will be adhered to by the majority of motor clubs.

38 LIBERTY CARS IN ONE DAY

Detroit, Mich., Oct. 20—Production at the plant of the Liberty Motor Car Co., this city, is increasing each day. The company reports a single day's production on October 13 of thirty-eight cars. The first car built was shipped but 3 months ago.

STEWART WARNER EARNINGS

Chicago, Oct. 20—The net earnings of the Stewart-Warner Speedometer Corp. for the third quarter show an increase of more than $150,000 over the earnings for the corresponding period last year. For the quarter ended September 30 the net earnings were $604,939; for the same period last year they were approximately $450,000. This was announced after a meeting of the directors today. It has not been the policy of the corporation to make public such production figures, and this new departure is said to be due to the fact that the stock recently has been listed on the Chicago stock exchange.

Other figures available at this time are there for the entire 9 months of 1916 so far. The net earnings for that period are $1,880,072. Although this shows a continued large increase in business, the directors did not increase the dividend rate or vote an extra disbursement at their meeting today. The regular quarterly dividend of 1½ per cent was declared and is payable November 15 to stockholders of record October 30.

KING TO INCREASE PRICES

Detroit, Mich., Oct. 15—The King Motor Car Co. will raise the price of its product to take effect in about 60 days.

WESTCOTT PRODUCTION INCREASED

Springfield, O., Oct. 19—Production at the plant of the Westcott Motor Car Co., this city, has increased about two and one-half times that of a year ago and a further increase is expected within the next half year. The present output is twenty-five cars a day.

Last July the factory was removed from Richmond, Ind., to its present location. The company was organized in Richmond in 1869 and became prominent as a manufacturer of horse-drawn vehicles. The increased demand for its car necessitated the removal to larger quarters, which are used entirely for the manufacture of the car. The new plant consists of a three-story building, consisting of 176,000 square feet of manufacturing space.

DISCHER BUMPER PATENT VALID

Milwaukee, Wis., Oct. 20—The Discher patent covering bumper bracket construction has been held valid and infringed by the Auto Parts Mfg. Co., this city, and a permanent injunction has been granted in favor of Grant F. Discher, president and general manager of the Gemco Mfg. Co., this city, which controls the patent. The patent, No. 1,052,224 relates to a bumper bracket having a lug, which bears against the front end of the motor car frame side member, and an adjustable clamp, using a transverse bolt passing through two vertical slots, one on each side of the frame member.

The Auto Parts Mfg. Co. petitioned for an appeal to the U. S. circuit court of appeals for a temporary suspension of the injunction. The court granted the suspension on condition that the company file a bond for $15,000 to cover any damages that might be sustained while the appeal was pending, should the higher court confirm the decree of the district court.

John F. Harper has been appointed special master to determine damages. The decree was handed down by Judge Geiger in the U. S. district court for the Eastern district of Wisconsin.

Shows Tires in Making

Goodyear Arranges Novel Display at Conference of Branch Managers

Thrown Open to Public Including School Teachers and Pupils

AKRON, O., Oct. 21—An elaborate exhibit tracing Goodyear tires and other products of the company from the tropical jungles to the finished product, ready for service, was one of the most interesting and instructive features of the Goodyear Tire & Rubber Co.'s district and branch managers' conference held at the Akron factory last week.

On the same floor with the conference room the company's experts had artistically arranged a most comprehensive layout of the entire Goodyear line, in a series of ten individual exhibits. Seven of these were given over to the display of pneumatic and solid tires, tubes, tire savers, motorcycle and bicycle tires, aeronautic supplies and mechanical goods. The other three displayed special features of the chemical, service and raw materials departments.

In each of the individual exhibits the particular product shown was traced through the successive steps in the process of manufacture. Unusually interesting and perhaps the most educational of all was the raw materials display in which were shown specimens of every kind of crude rubber, and samples of the numerous kinds of cotton fabric, entering into the making of Goodyear goods. This display included a section of rubber tree showing how rubber is taken, in liquid form, from the tree through incisions in the bark, and traced each step in the production of fabric, from the cotton plant to the finest grades of duck.

The service department display portrayed vividly how proper inflation and careful driving increases tire mileage, and how lack of care and improper inflation causes the premature demise of thousands of tires. A tire was shown which had run 44,115 miles in bus service.

In the chemical booth were shown the various ingredients which are mixed with rubber to make it more serviceable.

Such an unusual reception was accorded the exhibit by Goodyear employees that at the termination of the conference Goodyear officials decided to throw it open to the general public. Many school teachers and pupils took the opportunity to view it—as an interesting and practical lesson in geography.

CLOSER AFFILIATION OF JOBBERS

Boston, Mass., Oct. 21—The jobbing trade in New England is to be more closely affiliated with the National Association of Automobile Accessory Jobbers, according

to the object announced for a meeting to be held in this city, November 22. The ways and means committee of the association is to meet here November 20 and 21 and following its sessions, a general meeting of the whole New England trade will be held. To this are invited all the motor car interests in New England, whether filiated with the association or not.

LOVELL TURNS TO FORMER BUSINESS

Madison, N. J., Oct. 21—F. Hallet Lovell, Jr., who for the last 9 years has been the guiding head of the Lovell-McConnell Co., Newark, N. J., maker of the Klaxon horn, having sold out his interest to the United Motors Co., will retire from active participation in the motor car industry and will devote his time to other manufacturing enterprises, principally to the manufacture of marine and railway supplies carried on by E. H. Lovell & Co., Arlington, N. J., of which firm he is president and principal owner.

It was while he was engaged in this business, about 1907, that an inventor came to Mr. Lovell with a new and unique noise-making device. It was intended by its originator as a novelty signal for cars and was operated from the flywheel of the engine. When Mr. Lovell recovered from the effects of the first hair-raising screech of the new device he at once saw in its distinctive and impelling tone the keynote of a warning signal that would be heard and recognized instantly above all others, and then and there determined to make it "the voice of the motor car."

N. Y. Salesmanship Club

Organization an Outgrowth of World's Salesmanship Congress Meeting Last July

Has for Its Purpose the Betterment of Selling—Frequent Meetings

NEW YORK, Oct. 21—The New York Salesmanship Club, which is an outgrowth of the World's Salesmanship Congress, held in Detroit in July, has been formed and held its initial meeting Wednesday night at the Waldorf-Astoria with about 2,000 men present.

The club is one of a number being formed throughout the United States for the "Betterment of Business Through the Betterment of Salesmanship." Its work will include meetings every 2 weeks at which practical sales workers will speak and answer questions in an open forum. The plan is similar to that worked out by the Detroit club, which fathered the Congress last summer. It is proposed to have a permanent home for the club as soon as funds are available.

The membership list is growing rapidly. Life sustaining memberships may be purchased now by paying $250. The other memberships are: Sustaining, $50 a year for 5 years; associate, $10 a year until December 31 and $20 a year thereafter.

Initiation will be $10 after the membership list begins to assume proportions.

This makes it possible for the individual salesman to get in now for $10 and enjoy a year of membership; thereafter it will cost him $20 a year.

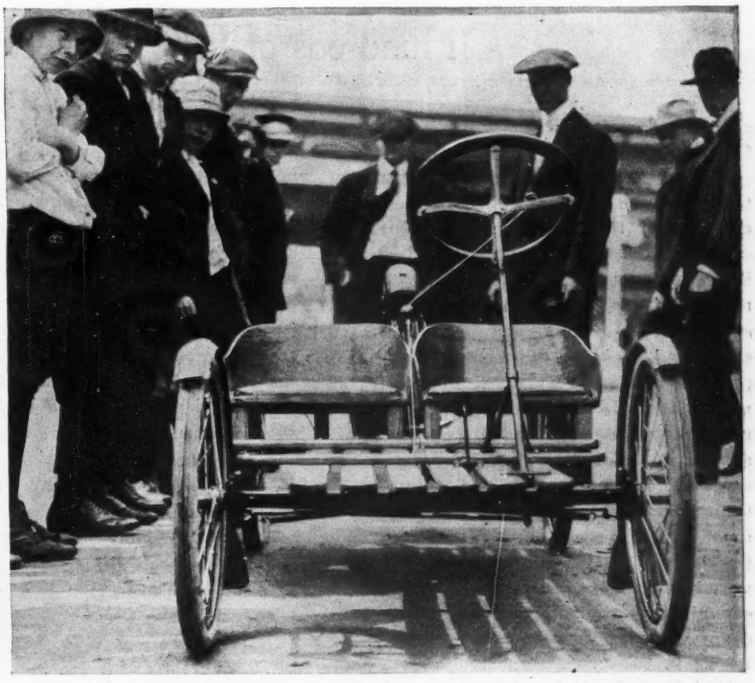
One of the features of the meeting was the variety of businesses represented and the caliber of the men who participated. There were big insurance companies, manufacturing concerns, food products makers and others.

HENRY SPLITDORF DIES

New York, Oct. 21—Henry Splitdorf, inventor of the magneto bearing his name, died here this week at the age of 82. His oldest son, C. F. Splitdorf, is head of the Splitdorf Electrical Co., Newark, N. J. Mr. Splitdorf was a native of Germany and a pioneer of telegraph instrument makers, having made them for Professor Morris, the inventor of telegraphy. Mr. Splitdorf was also the inventor of a liquid insulation for magnetic wire.

CHEVROLET BUYS WARNER PLANT

Toledo, O., Oct. 21—The Warner manufacturing plant, a branch of the Willys-Overland Co., has passed out of existence, having been absorbed by the Chevrolet Motors Co. The transfer was arranged some time ago. The plant will be used for the manufacture of transmissions for the six Chevrolet factories. The new company will employ about 1,000 men. Thomas W. Warner, president of the old concern, will continue as general manager under the new ownership. The Toledo Chevrolet Motor Co., has been organized.



THE SMITH FLYER, MILWAUKEE'S NEW CONTRIBUTION TO THE MOTOR TRADE

This is a motor vehicle evolved by the A. O. Smith Co., Milwaukee, Wis., from a four-wheeled buckboard and the Smith motor wheel, which has been helping the bicycle rider these last 2 years. Capable of 20 and 25 miles an hour and 80 or 90 miles on 1 gallon of gasoline, the weight of the car is but 78 pounds; with the wheel, 135 pounds. The wheelbase is 70 inches; tread 30; wheels 20, with double tube clincher tires and wire wheels. It is equipped with comfortable seats, tan upholstering, natural woodwork, mud guards, and has much nickel plating. Control is under the thumb on the steering wheel. A clutch lever raises or lowers the fifth wheel, or motive power. Sled runners can be used on snow and ice. Price, $125, f. o. b. Milwaukee.

Ford Melting Pot Makes Many Citizens

The Ford English school pupils and recent graduating class listening to address by Dr. M. F. Rice

Hundreds of Foreigners Graduated from Factory's English School

THE thousands of daily visitors at the Ford factory in Detroit see many interesting and instructive features. They observe, in the great engine rooms, the combination gas-steam engines with driving wheels as large as the ordinary locomotive. They witness in the shops, what seems to be endless mountains of gears, springs, lathes, bolts, motors and other parts and machinery that make up the vast plant. In one corner, they may see the coats of the thousands of workmen, arranged on hangers and looking more like the interior of a wholesale clothing house than a motor car factory. On the fourth floor of the main building they will find the Ford English school, interesting and very important both to the efficiency of the organization and to the citizens of the country at large.

Began in 1914

The Ford English school, known in Detroit as the Ford melting pot, started in 1914 with one teacher and twenty pupils. At present there are 2,720 pupils and 163 teachers. The instructors are men working in the offices and shops of the Ford company who voluntarily give their spare time without compensation, to the instruction of the employees who are unable to understand the English language. Attending the school is compulsory and those men who refuse to attend are disciplined by layoffs ranging from 1 to 2 weeks. "This compulsory education may seem harsh to many people," said Dean Samuel Marquis, in an explanation, "but a knowledge of English is absolutely essential to the principles of 'Safety First' and to the efficiency of the organization. And it also means better citizens for the nation to have the foreigners quickly taught to understand the English language."

The factory operates on three shifts with men working from 8 a. m. to 4 p. m.—4 p. m. to 12 m.—12 m. to 8 a. m., and two classes are held daily. The first occupies 45 minutes in the morning, the second an hour and a half in the afternoon as the men are thought to be less fatigued for the afternoon session. Compulsory attendance requires two meetings a week, but those who are more ambitious may go to the four weekly classes. Men passing the graduating examinations are given diplomas which are accepted by the United States government as proof of knowledge of English when the holders apply for second citizenship papers.

A sketch of Haralmbos Yannaki gives an interesting example of the work of the school, of its aid to the helpless foreigner, of its method of melting ignorant apathy into intelligent ambition and then welding into it the knowledge that makes the efficient, valuable citizen and workman.

What One Man Did

Five years ago Haralmbos was a cobbler in Macedonia. He heard of America and its golden opportunities and worked and saved until he had sufficient funds for a steerage ticket. In New York he found himself called a hunky, regarded with no importance, forced to work as a dishwasher and common laborer to earn a livelihood. He was told of the Ford factory in Detroit where foreigners were given opportunity and wages were big. He came and found a position. Three weeks later he enrolled in the English school and though asked to attend twice a week he came to four weekly classes. Eight months later he graduated, was elected president of his class and became Harry Yannaki, clerk in the edu-

cational department. At the recent graduating exercises held early this month, he addressed the pupils and members of the school in his adopted language and thanked them for the opportunity given to him.

The Ford company also gives two courses known as the student course and the tool-making course.

What Courses Include

The student course qualifies employees for salesmanship and mechanical knowledge. The more intelligent men only, are selected and are thus built for the higher positions. They attend the school for 1 year, are shifted constantly from one department to another in the factory and offices and later are used as branch managers and department heads. In this class the company placed fifty Indians graduated from Carlisle Indian school. The Indian school holds the Ford offer as an incentive to its pupils all of whom strive to be sent to the Ford factory. Dean Marquis reports that the Indians have been found to make the best workmen.

The school for tool making includes a course of 2 years and was established to meet the scarcity of skilled mechanics. All members of the classes are required to have a previous knowledge of higher mathematics.

American patriotism is strongly emphasized in all of the schools and the foreign element is taught that it forms a part of the citizenry of the United States, that it is strictly and solely American and that the hyphen is only useful as a minus sign. In the exercises of the recent graduating class of 250 members "America" and "Star Spangled Banner" were played by the Ford band and the thousands sitting about the melting pot arose and stood with hats off.

"We are taking no little pains to make the foreigners citizens in the best sense of the word," says Dean Marquis, "and are trying to lead these men to love their adopted country." And the help-the-other-man spirit in the Ford factory seems proof of the achievement of that aim.

The Ford melting pot, where graduates received their diplomas October 1, 1916

Manufacturers' Communications

DETROIT, Mich., Oct. 21—Editor Motor Age—We receive numerous letters asking for details on the construction of the Hudson racing car driven by Ira Vail and with which he has been so successful. The general impression seems to be that the Hudson Motor Car Co. builds racing cars and supports Mr. Vail in his undertakings. Such is not the case. Also, many seem to have the idea that the motor in Mr. Vail's car is a different type to that used in the standard Hudson Super-Six. Briefly, the facts are these:

Mr. Vail's car was originally a standard Hudson touring car, purchased from the Brooklyn, N. Y., agency, after having been used by it as a demonstrator for about 3 months.

The frame is standard in every respect except that 20 inches has been cut out of the middle just back of the transmission and the frame welded together again with reinforcements on the inside. The front and rear springs have been flattened out and leaves removed to suit the reduction in weight. The axles are standard with Timken bearings throughout and the gears used are stock gears supplied by the factory, the ratio being 2.61 to 1. This is the highest gear ratio that we supply.

All parts of the motor, with the exception of pistons, are stock parts. The pistons, while of our standard design, that is, having the same diameter wrist pin and with its bearing in the piston, are of Leavitt Magnalite metal. The camshaft and timing, the valve push rods, valves, and valve springs are stock. The valve springs have been increased in pressure by introducing washers between the cylinder casting and the top of the spring.

The standard carbureter is used in connection with the standard cylinder block. Our export type of cylinder head, in which the only difference is the metric spark plug holes, is used for the obvious reason that there is less chance for plug trouble with this head, owing to the better cooling of the plug shell and a reduction in the size of the porcelain.

The clutch, gearset, gear shift, propellor shaft and steering gear are all standard Hudson equipment and without any changes whatever.

The engine is fitted with the standard Delco system throughout. Therefore, this car has the distinction of being the only racing car on the tracks today which is equipped with a self-starter.

The radiator is smaller than standard, and, of course, there is no fan behind it. The bonnet and body are special, being made out of sheet aluminum and are very light weight. The exhaust pipe is of a special type and comes outside the bonnet and body to facilitate cooling, as is common practice in racing cars.

From the observation of such motors as Vail's on the dynamometer here at the factory, we would be conservative in stating that Vail's motor develops not more than 85 horsepower.

You may also be interested to learn that the Hudson Motor Car Co. has never built any special racing cars which were different from the standard product in any respects save the weight of the reciprocating parts and size of valves. The cylinder blocks on these motors were standard and the valve ports were simply bored out to allow a slightly increased valve diameter. The connecting rods were standard material but had the forging draft milled off to reduce the weight. The only time these motors have been used was at the Pike's Peak hillclimb.

From the foregoing, it would be evident that in every sense there is nothing about Hudson racing cars which cannot be obtained as a stock proposition with the aid of a little extra workmanship on the part of the mechanics who undertake to rebuild any Hudson.—Hudson Motor Car Co.

PAIGE PLUNGES OFF BRIDGE

Rolling around the streets of Duluth, Minn., is a Paige touring car with a record that should entitle it to membership in the submarine class, as well as a few blue ribbons for a come back stunt.

The Paige in question is owned by L. H. Dresser, a railroad official. Mr. Dresser recently was at the wheel of his car on the famous aerial bridge that is one of the sights of Duluth and which, with one exception in Europe, is the only one of its kind. Instead of operating a conventional draw this bridge moves over the water like a suspended cash carrier.

On this occasion the bridge was crowded to its capacity with traffic and in the jam resulting someone made a false move that precipitated Mr. Dresser and his car, along with a horse and wagon, into the water many feet below. The Paige fell 43 feet to the bottom of the canal, where it rested upside down, with Mr. Dresser pinned beneath the wheel. Although he is 65 years old, Mr. Dresser succeeded in extricating himself and reaching the surface of the water, where he was rescued.

The Paige car was successfully salvaged shortly after the accident by means of a block and tackle arrangement operated by a salvage company and was found to be little the worse for its plunge, a few minor breaks and smashed fenders and seats comprising the damage. Just to prove its recuperative abilities it was in operation on the streets of Duluth within a few hours after the accident and its owner is proudly claiming that he holds the demonstration record for the purpose of proving endurance and reliability.

Hyphen Tags Rejected

Jersey State Abandons New York Idea After Viewing 1 Year's Use

New Drivers Fee Will Entitle Licensee to Drive Any Car

TRENTON, N. J., Oct. 21—After a year's trial of the hyphenated-license tags of New York, the New Jersey motor vehicle department has decided that it has no use for the hyphens. It is claimed by the Jersey officials that the majority of reports sent in of violations of the laws by New York motorists on Jersey soil were made valueless by the fact that the hyphen confused the person reading the tag and in several instances only the figures in front of the hyphen were noted and reported. Commissioner William L. Dill is emphatic in his disapproval of the hyphenated numbers and is well satisfied with the efficiency of the present tags.

Beginning with January 1, 1917, amendments to the New Jersey Motor Vehicle Act will go into effect. Whereas, driver's licenses have been charged for according to horsepower—$2 to drive cars of less than 30 horsepower, and $4 to drive cars of 30 and greater horsepower—the fee will be a general one and $3 will entitle the licensee to drive any car whatsoever.

The New Jersey laws require a learner to have a permit, good for 3 weeks, during which time he can learn to drive a car under the constant supervision of a licensed driver. Heretofore the permits have been issued free of charge. The newly amended law makes a charge of 50 cents for each permit.

INTER-STATE SUES RUTENBER

Indianapolis, Ind., Oct. 23—Suit for $700,000 damages has been brought in federal court by the Inter-State Motor Co., of Muncie, Ind., against the Rutenber Motor Co., of Marion, Ind. The complaint alleges the two companies entered into a contract on July 30, 1915 for the delivery of a minimum of 3,000 motors in a specified time, and that a supplemental agreement signed in November, 1915, provided for an increased delivery of 5,000 motors.

On the basis of the contract the Inter-State company alleges it made investments in nearly $2,000,000 in other parts and that it received orders for 5,000 cars. The plaintiff asks damages on the ground that the Rutenber Motor Co. has failed to deliver the number of motors called for in the contract.

GARAGE BODY CHANGES NAME

Rockford, Ill., Oct. 20—Much interest has been shown the last 2 days in the convention of the Garage Owners' Association of Illinois which closed its session here last night. This association will not be known by this name in the future, the corporate title having been changed to the Illinois Automobile Trade Association, which will form the Illinois division of the National Automobile Trade Association.

The association now has 350 members, made up of the memberships in some ten or twelve local organizations. Delegates from the local organization are sent to the meetings of the state association, two delegates being allowed for the first ten members and one for each additional ten, in all about 100 were present at the convention, fifty of these being delegates.

Gail Reed, general sales manager, Walker Vehicle Co., Chicago, had a paper on Measured Garage Service vs. Flat Rate. He contended that the garage business is turning to the measured rate and that within another year it will be hard to find a garage charging the flat rate for service.

GILBREATH'S SUCCESSOR NOT NAMED

Chattanooga, Tenn., Oct. 21—No successor has yet been chosen to W. S. Gilbreath, as field secretary of the Dixie Highway Association, Mr. Gilbreath having resigned to accept the secretaryship of the Detroit Automobile Club. He was one of the original promoters of the Dixie highway project and has been largely instrumental in bringing it to its present success.

BANTA BECOMES PREMIER V-P

Chicago, Oct. 23—A. J. Banta, branch manager in Chicago for the Locomobile Co. of America, resigns this position November 1 to become vice-president of the Premier Motor Corp. at Indianapolis. Banta has held his present position with the Locomobile Co. for the past 12 years.

He is succeeded by J. Murray Page, manager of the Los Angeles branch of the Locomobile Co. Mr. Page has been in the service of this concern since 1899, spending part of that time in the Locomobile factory, and a part as branch manager in San Francisco. It is understood that Banta will handle production at the Premier plant.

LEVY AGAIN GETS CHALMERS

Chicogo, Oct. 20—James Levy again becomes the distributor of the Chicago territory for Chalmers cars, succeeding Harry Newman, Inc., which has been the distributor for these cars for the past year. Levy takes over the distribution from Chicago, Milwaukee and Springfield, Ill., the territory which Newman has had. In addition to the Chalmers cars, Levy at the present moment is distributor for Premier, Scripps-Booth, H. A. L., Saxon and Marion-Handley. Whether or not all of these lines will be continued has not been determined as yet. The Newman company expects to close up and Harry Newman himself will engage in other lines of business, but his future plans have not been announced.

Question Assn. Motive

So-Called Motor Car Protective Association Alleged to Misrepresent

Members Who Bought Insurance Said to Have Something Else

COLUMBUS, O., Oct. 21—War has been declared on the so-called motor car protective associations by the Ohio state superintendent of insurance, that office having received numerous complaints from persons who thought that in buying memberships in these protective associations they were buying insurance and found out too late they had bought something else.

The matter has been referred to the attorney-general and it is said that if these protective organizations make persons believe they are writing insurance they will have to conform to the insurance laws of the state or quit business.

In case more stringent legislation is required to make plain to motorists just what they are buying, the backing of the Ohio State Automobile Association for a bill to this end will be sought.

The department has sent out a special investigator to look into the operations, the so-called policies and general conduct of the protections. Clubs in many cities of the state receive frequent calls from motorists who believe they bought insurance when they invested in the policies and other benefits of the associations.

LAW BREAKERS BEFORE BOARD

Chattanooga, Tenn., Oct. 21—Violators of the motor laws in Chattanooga can no longer keep on violating as long as they pay fines under a new system which has just been started. Under a new ordinance, a board of traffic regulation has been established, consisting of the commissioner of police, the police chief and the chief of the fire department. Those convicted of breaking the traffic laws hereafter must secure a permit from this board before driving again. A fine of from $5 to $50 is imposed for violations of this rule. As the board will meet only once a week, a violator may have to wait a week before securing his permit.

ROAD BUILDERS MEET NOV. 2

New York, Oct. 21—The annual meeting of the American Road Builders' Association will be held November 3, at the Automobile Club of America. The sessions will commence at 2 p. m. Aside from a meeting of the board of directors and reports of officers and committees, the principal interest of the meeting will center in the election of officers for 1916-1917. This is now being conducted by means of a mail ballot, but the polls will not close until 4 p. m. on the day of the meeting.

Chevrolet Makes Development Stride

New Departments, Increased Floor Space, Additional Machinery and Buildings

FLINT, Mich., Oct. 21—Two large buildings completed, two more in process of construction, several new departments, installation of hundreds of lathes, presses and milling machines, and double the number of workmen are some of the recent developments at the factory of the Chevrolet Motor Co.

One new building 1,000 by 150 feet, has just been completed and is now used for an axle plant, motor works, transmission assembly and heat treating plant on the lower floor and as a tool room on the second floor. Next to it and of the same dimensions, is another structure recently finished which serves as a motor works and stock room. The machinery is erected in the center of the floor with the stock rooms running along one wall with numerous doors from which the tubing, raw casting and other material can be fed directly to the workmen. Both plants are built entirely of steel, brick and glass and embody a novel and valuable lighting and ventilating system. The two walls in each structure, 1,000 feet long, are constructed of glass supported by steel and the thousands of windows are arranged on shifting mechanism allowing them to be opened at will and throwing daylight in every corner of the interior, besides providing excellent ventilation. This system is supplemented by additional glass, built in V-shape on the roof, which also has the sliding shaft allowing each window to be opened. Both structures are equipped with hundreds of new lathes, presses, milling machines and ovens.

U-Shape in Construction

A large building constructed in U shape with two sections, each 1,000 by 80 feet, and three stories high with a court 50 feet wide in between, is in process of erection and will be used for the assembly of the Four-Ninety model when completed. It is built of brick, glass and steel and will probably be ready for occupancy on December 1. Directly behind it the company is building a four-story structure which will serve as a powerhouse and heating plant thus giving all necessary power from within the institution.

The new buildings give the company 466,000 square feet of floor space additional to their present equipment. There are now double the number of workmen employed 1 year ago and the completion of all buildings in process of construction will witness the addition of 1,000 more men.

Many other interesting and important features have been introduced. There is a large top department where the company paints and attaches winter tops for the Four-Ninety model when it is so ordered. Many new ovens recently have been purchased and installed for the paint department which have been found greatly to facilitate that work. The frames, with the motors and gas tanks attached, are placed upon trolley conveyors and sent through the first ovens following a coat of paint put on by the flow system. They emerge and pass a short distance, by which time they dry and are ready for varnishing and the second series of ovens. The varnishing is done by spraying machines. All painting is accomplished by the flow method. In the body room one may see a number of bodies arranged on roller wheeled trucks and standing directly under a long heavy pipe filled with paint. Numerous short thin pipes feed from the main line and each is attached to rubber tubing which ends in a nozzle from which the paint flows by gravity force. Each nozzle is directed by a workman so that the paint reaches all parts of the body flowing from the upper edges to every section below.

A new progressive drilling machine is in use in the motor works. A workman picks up a raw casting of a motor base for cylinders from a constantly-filling stack, places it on a roller truck which operates over tracks, pushes it to one end of the drilling machine, turns it over on a swivel and places it under the first drill. Each time he installs a base for drilling, those in the succeeding drills automatically move up to the next drill and eventually emerge with all necessary holes drilled in them.

Contrast Seen in New and Old

Probably the most interesting feature of the factory is to be found in contrast between the old shops and the ones just added. In the old buildings which up to the present were used for all construction and assembly work, the floors beginning in the basements are filled with machinery, crowded with men, dark and poorly ventilated. The ceilings are a scant 10 feet high. In the new structures there is light, space, air, and the change is easily noted on the workmen who seem less grimy, less fatifiued and far more energetic.

PURCHASES CHICAGO ELECTRIC

Chicago, Oct. 20—The Anderson Electric Car Co. has purchased the Chicago Electric interests of the Walker Vehicle Co. and will shortly take over all the new Chicago electrics completed and those in process of manufacture together with all parts and service. The Walker Vehicle Co., which is owned by the Commonwealth Edison Co., will devote its efforts to the building and selling of Walker electric trucks. Gail Reed, general sales manager of the Walker company, in company with others, has been engaged to promote the sale of electrics for the Anderson Electric Car Co.

When one is picking his way around France just now it is well to be on the alert for bursting shells, and shrapnel may drop almost anywhere. Here is how close a shell dropped to this party

Indorses the Eno System

Denver's Traffic Sergeant Expresses Opinion on Motor Age's Campaign

DENVER, Col., Oct. 20—The campaign being conducted by Motor Age to establish a uniform traffic law in cities of 5,000 and over is strongly indorsed by Traffic Sergeant Robert W. Thompson, of the Denver police department, who has had more than 8 years' experience as a traffic officer here. From his practical contact with traffic problems which have developed under conditions prevailing in Denver, he gives the following views:

"To possess a reasonable and an inforceable traffic ordinance is a most worthy ambition for any city, and to have such regulations uniform throughout the country would certainly be worth the effort. It is the one thing at the present time that all people should be interested in, and Motor Age should be given hearty support by all concerned in its effort to find the best method of handling traffic.

"Every man seems to have an idea of how traffic ought to be handled, but each man has a different system; and the same holds good in towns, cities and states, which situation results in confusion and accidents.

"It is easy to propose traffic ordinances, and it is fairly easy to enact them into laws; but where the rub comes is in inforcing them. Unreasonable and unpopular traffic regulations cannot be inforced by the police. A few drivers acquaint themselves with the ordinance of the city, while the rest drive in a haphazard manner. I believe every driver should be compelled to pass an examination on his knowledge of the traffic rules before he is given a permit to operate a car.

"Drivers of vehicles ought to learn to understand that the traffic officer is their friend. The officer stands in the street to see that the driver, as well as everybody else, passes over the streets in safety; and in order to accomplish this, certain general rules must be observed. If the majority of drivers in Denver did not co-operate with the traffic squad in handling traffic in the congested district, we would be at a loss from the start.

"I find that most accidents result from a lack of presence of mind on the part of drivers and pedestrians when an emergency arises. Few accidents would occur if, when a collision is imminent, all parties would keep their heads. For this reason, I believe in all practical efforts to educate the public along the fundamental lines of making traffic safe for everybody.

"I find that the semaphore system in use here is a very successful way of handling traffic, as it enables the traffic officer to clear two blocks of traffic at a time without delay or confusion, and the semaphore is plain and explicit, easy to understand and easy to operate. Where traffic officers on adjoining intersections work in unison, this method handles long stretches of traffic rapidly. If we can find a whistle that won't make the mouth sore, we expect to use whistles to give notice that the line of travel is going to be changed. One blast will be a signal for traffic to stop at the property line. We believe that this method of using a whistle in conjunction with the semaphore would reduce delay and confusion to a minimum, because it would warn people in time to prevent rushing into the intersection just when the 'Go' sign is about to be changed to 'Stop.' We now require that all traffic at intersections must proceed in single file, and insist that all drivers of vehicles plainly indicate to the traffic officers the direction they intend to proceed.

Likes the Plan

"I have looked the Eno system over very carefully, and have no fault to find with it. I wish to compliment its author on the clear, fair and brief manner in which he has written it. A fair, simple, reasonable set of rules is all that is necessary, and these ought to be administered and obeyed with a good, big dose of common sense on the part of all concerned.

"The slow, heavy vehicle, the reckless bicycle rider and the absent-minded jaywalker who stands upon his constitutional rights as a citizen and a taxpayer to risk his life through absurd carelessness form an element in traffic regulations that needs some rigid law enforcement.

"Traffic officers ought to be chosen from the most competent men in the police department. They should be men with good judgment and good manners and thoroughly posted on traffic regulations. The members of the Denver traffic squad are instructed to use the utmost care and patience, and especially to put forth every effort to handle tourists without either arrest or reprimand. 'Bawling out' is not a part of our code of conduct.

"The provisions of the Eno ordinance are practically all embodied in the present Denver ordinance or in the proposed new ordinance now pending before the city council. The main exceptions are principally in minor details, such as having no one-way traffic streets here, planning a time limit for parking or ranking cars on downtown streets, speed limits, passing street cars, right of way, and absence of safety zones.

"There is not yet sufficient congestion to require establishing one-way traffic on any of Denver's streets. All things being equal, the vehicle approaching a street intersection from the right has the right way. Street cars are now permitted to make the far-side stop, but the near-side stop is intended in the pending new ordinance. Vehicles must stop at the rear of a street car that has stopped to receive or discharge passengers, and our streets are too narrow to make safety zones practical where there are two street car tracks and vehicles are permitted to park or rank along the curb. The width of our streets ranges from 45 to 60 feet, and on the narrower streets having street car lines, vehicles must be ranked with the right-hand wheels not more than 1 foot from the curb, and with at least 4 feet of space between cars, forward and back.

"The note attached to Article III is now under discussion in connection with the proposed traffic ordinance, and there is considerable debate as to whether a time limit for parking or ranking cars should be uniform on all downtown streets or varied according to whether the streets have car lines or not. The suggestions for time limits range from 15 minutes to 2 hours. We are also planning to establish clearance spaces of 25 feet in front of buildings four stories or more in height, and also in front of theaters, hotels and city, state or federal buildings. There is now a 60-foot intersection clearance where street cars stop. We have also been experimenting with the middle parking plan where there are no street car lines, and have used marked spaces for this purpose.

"Our present speed limits are 10 miles in the congested district and 15 outside,

Chicago Car Locking Measure

Chicago, Oct. 23—The Chicago police department is about to inforce an ordinance prohibiting the locking of wheels or steering gears on cars standing along the curb in a way that will prevent them being moved forward or backward by the police in case of fires, acident, etc.

The department now has framed an ordinance for Chicago to prohibit the leaving of any car on the street unlocked, this being a police recommendation to stop joyriders, etc., and it appears to be only a matter of time when all of the large cities will follow this lead.

with reduced speed required at street intersections. The proposed ordinance calls for 12- and 20-mile limits. As previously stated, traffic officers use the semaphore system instead of whistles.

"The order for all police officers as suggested at the close of your article is an excellent idea, and I also heartily recommend the adoption of a standardized accident blank.

"Regarding headlights, I believe that the only practical and thorough way to solve the glare problem is to tip the headlights and thus accomplish the double object of preventing glare and at the same time providing sufficient light to drive by. This can best be done by setting the lights higher than they are regularly placed and then tipping them to gain the proper light on the road up to 70 feet or farther ahead. Two stationary spot lights focused to strike the ground at about 75 feet will demonstrate this principle. I favor this method of preventing glare because it gains the double result stated, and also because up to the present time, so far as I can learn, no dimming device has been found that is acceptable to everybody concerned. There is no practical standard to go by, and this is too serious a problem to be left largely to personal opinion.

"The main things I have discovered in handling traffic are the following:

"Ninety per cent of drivers are negligent in backing their cars without giving proper warning or even looking back.

"The provision against parking or ranking cars within 10 feet of a fire hydrant is habitually violated.

"Machines are frequently ranked with the rear wheels blocking an alley.

"It is a common practice to park motor cars where the rear wheels interfere with street cars, especially on curves.

"Where cars are ranked, they are often found so close together that all cars are blocked from being gotten out until a car at one end of the line is moved.

"Pure absent-mindedness in driving past a traffic officer with a semaphore set at 'Stop' and thereby risking collision or other serious accident.

"A vast amount of confusion caused by two persons trying to indicate at the same time the direction a vehicle intends to take.

"On all slippery pavements, the use of skid chains on the rear wheels of motor cars should be required.

"Where vehicles are required to stop at rear of street car standing to receive or discharge passengers, the motorman or conductor should be required to signal vehicles in case the street car stops for any other purpose. This will avoid confusion and needless delay of traffic."

Simplify Motor Laws

WASHINGTON, D. C., Oct. 21—"We now have too much motor car law. The next trend must be toward the elimination of all unnecessary requirements and the enactment of a few simple rules and regulations that may be easily understood, easily inforced, and, as nearly as possible, universally observed. Such an elimination would in many instances do away with about three-fourths of our present laws."

President H. M. Rowe of the American Automobile Association thus sets forth the present problem of the motor car owner.

"Traffic rules and regulations are yet in their formative period. Much remains to be done before avoidable accidents may be reduced to a minimum. The principal difficulty is the unwillingness of the public to accept and obey such rules and regulations. While there has been some change in its attitude within the last year or so, there still remains an immense amount of educational work before we can hope to secure the co-operation from the public, which is necessary to the efficient working out of any set of rules for the road and the government of its traffic.

"It is needless to say that the motorists themselves deplore most keenly the steadily increasing number of accidents and fatalities occasioned by the use of the motor car, but the people have not yet come fully to realize that these accidents are the result of negligence on the part of the public to observe the simplest rules of personal safety rather than neglect on the part of the motorist. The utter disregard of his personal safety shown by the average individual when occupying the public highways is appalling.

"It is a matter of undisputed record that between 90 and 95 per cent of all the accidents that occur result from the neglect of the individual pedestrian and less than 5 per cent are caused by the direct fault of the motorist or the reckless use of the motor car. Lying between these figures somewhere are from 3 to 5 per cent of the accidents where both parties are responsible.

"Simple as it may seem, a set of traffic rules and regulations that will work out in practice are not easy to prepare. It follows that rules and regulations which will work out are those that will permit vehicles and individuals to move with the largest degree of freedom without coming in contact with each other.

"With the fatalities caused by the carelessness of motorists now reduced to less than 5 per cent of the whole, if the proper co-operation of the public can be secured, cannot we reasonably hope to reduce the 90 per cent of fatalities attributable to the carelessness of individuals to 9 per cent. In any event a limited number of unavoidable accidents will occur but it does not seem unreasonable that of each 100 accidents now occurring, ninety of them may be avoided. Surely such a possibility should be a sufficient incentive for putting forth our best efforts."

Non-Uniformity Unbearable

JAMESTOWN, N. Y., Editor Motor Age—The present lack of uniformity in traffic rules is unbearable. They differ not only among the states but within the state and even within the counties. There can be no doubt that a large proportion of the motor car accidents are due to lack of understanding on the part of all concerned as to which is the correct way to proceed. About the only general rule for traffic at present is to meet on the right and pass on the left. To this general rule for traffic should be added at once a rule for cars meeting at right angles. I believe the plan of giving the right-hand precedence is better than the north and south sides, as tourists entering the city frequently lose their sense of direction.

I feel sure that the commercial organizations of this state will be glad to take this matter up with you in an intelligent way in an endeaver to solve this harassing problem.—F. C. Butler, Secretary Jamestown Board of Commerce.

Problem for States

RICHMOND, Va.—Editor Motor Age—I notice the idea of having every city of 5,000 having a uniform traffic law is brought out in your article on standardizing traffic rules. It has occurred to me, if it were practicable, would it not be better to have each state enact a law to cover all cities of 5,000, or more, inhabitants? It seems to me that inasmuch as state laws apply to questions of debt, lawsuits and criminal offenses that motoring could be legislated by the state as well as these other things. There are one or two things that have occurred to me which would hardly be necessary to have a law to inforce, but probably a suggestion in connection with the law would be advisable. First, that motorists should not park their cars by posts intended for hitching horses, nor around water troughs. Second, in making the right-hand or close turn into narrow streets from a broad street the driver should approach the middle of the street and in this way when he turned, even though he were driving a large car, he would come in close to the curbing.

I think the suggestions for signaling for turns by either holding the hand stationary or back and forth movement, is excellent and I would suggest that a car behind, when such a signal is given, should make some signal with the horn to show that they have observed this signal and can stop their car if necessary, and likewise to have a signal to use in case they are too close to stop the car in time to prevent a collision.

With regards to school signs. Personally, I should be opposed to this for the following reason: It would necessitate a great many signs in any city of any size, which signs would not add to the beauty of the city. These signs would only be necessary except for probably 2 hours in any day. When children are congregated in any number around a school building it is certainly easy for motorists to see them. I always feel that a child is in more danger when playing in the streets because it is likely to run suddenly across the street, and I think that the motorist should at all times have the car under control and not be made to feel that a child's life is more precious when at school than at any other time. In cities where schools are on main thoroughfares, I think it would be advisable at the time of opening and closing of school and recess to have a traffic officer present, if necessary. I think the public needs to be taught to cross the streets at the crossings and to avoid crossing in the middle of the block.—Reader.

Preservation of Tires in Winter

Elimination of Roadside Changes— Methods of Storing

By Wallace B. Blood

TIRE trouble in winter is as aggravating as leaky shoes on a slushy day. Improperly stored tires—if you do not drive in the winter—are about as fit for spring service as a pair of summer oxfords relegated to a dusty basement. You will wear rubbers or oil your shoes in winter to keep your feet dry and save the shoe leather. You will put your summer oxfords on shoe trees and store them away in a clean place. Yet you will start the winter season with the tires of your car in poor condition or store them away either with the weight of the car on them or thrown in a heap in some warm, damp room.

The consistency is in inverse proportion to the valuation. Tires cost more than shoes and surely merit your attention.

In winter driving the following salient points should be observed:

There should be no unfilled cuts in the tread.

Puncture abrasions which are not large enough to impair the use of the tire should be sealed, either by vulcanizing or by filling with a preparation made for the purpose.

Overloading should be avoided. One overload produces a strain which weakens a tire for all time.

No rust should be allowed to accumulate on the rim. The wet driving of winter will create rust rapidly and it should be closely watched for the interior of the casing should be cleaned of all sand and dust and generously powdered with talc or soapstone.

The valve nut should be tight.

What Republic Says

Regarding these points, William L. Stevenson, manager of the service department of the Republic Rubber Co., has written Motor Age as follows:

"The proper care of tires at the different seasons of the year, will greatly reduce the number of tire changes on the road. Of all seasons, no doubt, winter is the worst, and productive of the most discomforting and ruffled feelings.

"The bugbear of winter driving is water working its way through neglected cuts in the thread, where it rots the fabric and in time causes a blowout. A careful examination of your tires in the late fall, filling the small tread cuts with rubber gum made for the purpose and in taking care of the larger ones by vulcanizing, will greatly lengthen the life of the casing.

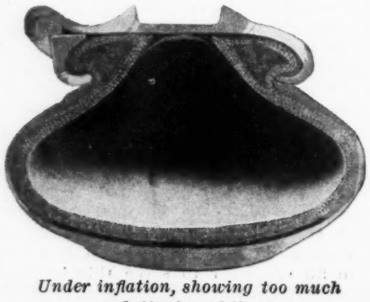
"Punctures through the tread and fabric of the casing should receive prompt attention at all times of the year, and more particularly in winter because of the deteriorating effect of water in rotting and causing irregular breaks in the fabric, eventually causing a blowout.

Effect of continual use of tire chains which are fastened too tight

"Overloading is another cause for winter tire changes by the roadside. Many know that continuous overloading greatly weakens the tire. However, the first overload produces the strain, which has weakened the tire for all time.

"Another cause for the short life of a casing is from improper care of the rim. It is surprising the deteriorating effect a rusty rim will have on the fabric of the tire above the bead.

"At this point the tube should come in for its share of the inspection and care. The valve nut should be tightened and all trace of sand or lumpy soapstone and all other foreign substances removed from the casing. Care should be taken that the flaps are properly placed, in order that there may be no danger of pinching, particularly on spare tires when mounted on a rim, as the pinch would not be noticed until the weight of the car was placed on the tire.



Under inflation, showing too much flattening of tire

"An inspection of your tire and tube equipment before the winter sets in, with the proper steps taken as above outlined, with the rim properly cleaned and a coat of graphite applied, I believe the necessity for changing tires on the road in winter will have been practically removed."

There is a great deal that can be said about the manner in which a car is handled on winter roads. In localities where street cleaning is not the best, drivers are tempted to run the wheels of their cars in street car tracks to avoid the rough packed ice and snow. This will soon ruin the tires. The same is true in driving in frozen ruts. It is better to avoid both the car track and the rut and drive over the untraveled portion, even if it is bumpy.

Regarding this the Firestone Tire and Rubber Co. makes the following statements:

"Quite often the pavement along the inside edges of the track is rough and may result in cuts to the rubber and bruises to the fabric. Driving over street car track switches at the pointed frogs may cut the tire seriously.

"Rails on hills are to be avoided as much as possible as they usually have sharp, thin splinters on the edges, which are liable to cut or puncture the tires.

Driving on Wet Rails

"Be careful when driving on wet rails; quick twisting of the front wheels may result in accident from the rear of the car skidding sideways when leaving the rails.

"The edges of the rails wear away the tread rubber and cause a sharp bending action of the fabric, which will usually develop breaks inside. It is just a matter of time until the rubber cover loosens underneath and the fabric weakens from moisture and decay."

Anti-skid devices are advisable and often imperative for winter driving. However, regardless of their construction, their continued use is bound to wear the tires. They should only be put on when actually needed. Some devices are noisy and there is a temptation to fasten these tightly to the tires to eliminate the rattle and hum they create. When this is done, the extra pressure and flattening out of the tires at the point in contact with the ground, will cause the cross chains to cut and gouge into the rubber tread and fabric underneath. When cross chains become worn and rough they

should be replaced immediately, otherwise cutting of the casing cannot be avoided.

Another great temptation in winter driving is to neglect to watch the inflation pressure of the tires. The tires should be kept at the proper pressure in winter just as much as in summer. With an under-inflated tire, the rough ruts and ice of winter streets will soon pound holes through the casing where they come in contact with the rims.

Now we come to the manner of tire storage and what to avoid.

Goodyear makes the statement that tires are more likely to suffer than almost any part of the machine when it is stored for winter.

Goodyear advises that, when the car is stored for the winter, it is best to remove the tires from the rims.

"The room in which they are stored should be moderately cool, because excessive heat or excessive cold will tend to deteriorate rubber. A dark room is preferable, as rubber is affected by light. If, however, dark quarters are not obtainable, the tires should be covered with a large canvas.

"Tubes should be inflated slightly, enough to cause them to stand round. They should be piled in the same manner as the casings with a covering to prevent their exposure to the light. Tubes may be safely allowed to remain in the casings, if care is taken to see that the cas-casing are well dusted inside with talc.

Remove the Tires

From Marathon we have the following suggestions:

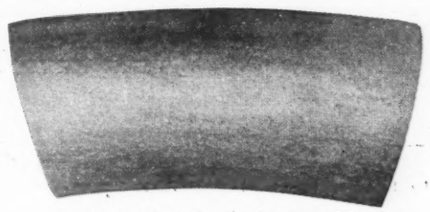
"We have learned from experience that the most satisfactory means for preserving tires during the winter months may be obtained by removing the tires from the car and wrapping them in heavy paper or burlap. They should be stored in a place where the temperature does not exceed 65 degrees. Before the tires are stored away they should be carefully inspected and all small cuts in the tread and side-walls repaired.

"However, if the owner expects to use the car somewhat during the winter months, he can obtain very satisfactory results by jacking up all four wheels from the floor and deflating the tires until only enough air remains to keep them rounded out.

"Before taking the car out in the spring it is advisable to inspect the rims of the wheels carefully and remove all rust and uneven places. The rims should be painted with graphite before the car is laid up for storage."

Kelly-Springfield has the following to say regarding tire storage: "Inasmuch as light and heat are detrimental to rubber, it is best to remove the tires from the rims, make certain that they are not damp, and cover them with strips of paper which will effectively exclude all light. The tires thus wrapped should then be kept in some cool, dry place, such as the basement of the house or a clean corner of a heated garage."

Cracked condition of rubber due to effects of light and heat when tires are improperly stored for winter



Deterioration of inner tube caused by its being exposed to light and heat

The spare tire is a sadly neglected accessory. I once knew of a car owner who bought a new car with four very good tires and a spare. He fastened the spare on the rear tire support, without covering, and drove 13,000 miles before he had a puncture. This is an unusual record, but this mileage is accurate. When the time came for him to change one of the tires, he put on the spare, drove 5 miles and had a blowout. The spare had become cracked and fairly rotted due to the exposure to light and heat and was practically useless before it had been driven a mile.

By all means provide your spare tire with a cover. If you remove a tire in your garage and it has been standing on an oil soaked floor, wash off all the oil before putting it on the tire carrier or storing it away. Oil will soon ruin rubber. Use soap and water to remove the oil.

Many owners will equip a spare rim hastily with tube and casing, blow it up and lock it onto the tire carrier. Later, when they have occasion to use the spare, it will perform well for a block or two and explode, due to a tube which was pinched in careless assembly. On cold winter days, such a proceeding is surely annoying. The spare should be tested by running it several miles, before it is locked onto the tire carrier.

This tire was driven soft and when passing over rough places flattened so that beads chafed and bruised the fabric

The spare should not be kept fully inflated. It is surely a matter of convenience to have a full spare tire, but it is not a good thing for the tire. Just enough air should be kept in it to keep it round.

Illustrations by courtesy of Firestone Tire and Rubber Co.

GOODYEARS ON MAXWELL

Rickerbacher's Maxwell, which drew third place in the Chicago Grand American race, was equipped with Goodyear tires. Motor Age's equipment table, published last week, was in error. Goodyears have been the Maxwell driver's equipment throughout the season.

WOODRUFF MANAGES SIMPLEX SALES

New York, Oct. 21—A. A. Woodruff has succeeded A. M. Barbour as sales manager of the Simplex Automobile Co. He joined the company this year as manager of the body department and later became assistant sales manager. He entered the field in 1900 forming the Woodruff Mfg. Co., to build motor car bodies and later was connected with the E. R. Thomas Motor Car Co., as producing manager.

WHITE NET PROFITS $1,623,521

New York, Oct. 21—The White Motor Co., Cleveland, O., reports a surplus of $1,623,521, which is equivalent to 11 per cent on the $16,000,000 capital stock. Net profits from operations were $2,635,784 during the 6 months ending June 30, 1916. Adding $115,208 in other income, brings the total income to $2,750,923. The expenses of the company amounted to $847,472 and the dividends up to the March 31 quarter to $280,000, thus bringing the surplus to $1,623,521.

The company has $16,000,000 capital stock, $50 par value, with no bonds and no preferred stock. The company is paying 7 per cent dividends on the stock. Net profits in the year 1915 were aproximately $8,700,000, over 54 per cent on the stock.

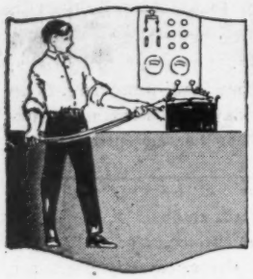
The combined balance sheet of this company and subsidiary companies as of June 30, 1916, as reported to the New York stock exchange, follows:

ASSETS

Plant, equipment and real estate	$ 3,558,547
Goodwill, patents, etc	5,388,910
Materials and supplies	5,539,025
Accounts receivable	2,112,932
Bills receivable	804,967
Cash	2,022,337
Deferred assets	114,991
Total	$19,541,710

LIABILITIES

Capital stock	$16,000,000
Purchase money obligations	390,000
Current accounts, etc	1,282,535
Reserve for depreciation	85,902
Accounts and bills receivable	159,751
Surplus	1,623,521
Total	$19,541,710



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the eighteenth installment of a weekly series of articles which began in Motor Age issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.

Part XVIII—Purpose and Operation of Cutouts

THE electrical generator in its application to the motor car is almost always used in combination with a storage battery. The generator is used to charge the battery and to produce a current in the various electrical devices on the car while the generator is in operation. The battery serves as a sort of reservoir in which electrical energy may be stored and then used when the generator itself is not operating. A battery and generator are shown connected in series in Fig. 127. The positive terminal of the generator is connected to the positive terminal of the batteries and their negative terminals are connected together. The effective pressure acting in such a circuit is equal to the difference in the pressure produced by the generator and the pressure produced within the battery.

If these two pressures are equal, the value of the effective pressure will be zero and there will be no current in the circuit. If the pressure produced by the generator exceeds in value the pressure produced by the battery, there will be an effective pressure

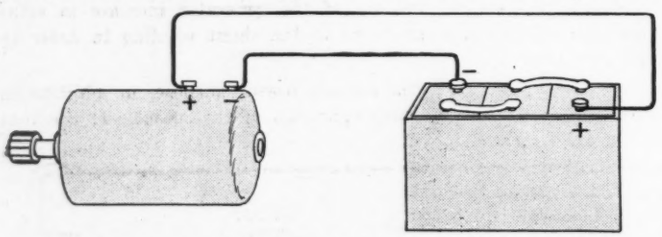


Fig. 127—Simplest connection of generator and storage battery. When generator is not supplying current, the storage battery discharges through it

acting in the circuit and its direction will correspond to that of the larger pressure, or the pressure of the generator. The current produced by this effective pressure will charge the battery, and the value of the current will be equal to the effective pressure divided by the total resistance of the circuit, including the internal resistance of the battery, the resistance of the connecting wires and the resistance of the armature winding of the generator.

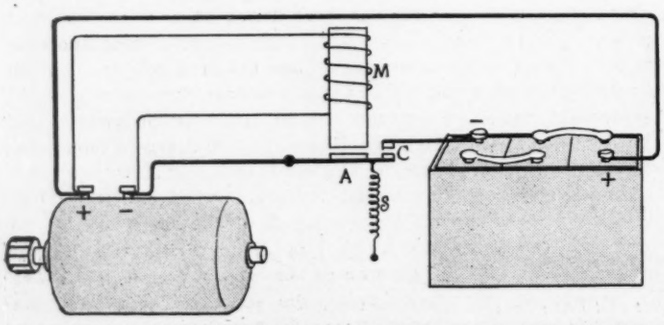


Fig. 128—A simple form of magnetic cutout. The circuit is broken at C whenever the generator is not developing sufficient current to magnetize M and draw A up to it

If the pressure generated in the armature winding of the generator is less than the pressure of the battery, then the effective pressure will be in the direction of the battery pressure and the battery will discharge instead of being charged. The value of the current will, as in the previous case, be equal to the effective pressure divided by the total resistance of the circuit.

Since the pressure generated in the armature winding of the generator may vary in value from zero on up, depending upon its speed and field control, it is apparent that some means must be provided for controlling the connection between the generator and the battery in order that the battery will not be allowed to discharge through the generator when the pressure of the generator becomes lower than the pressure of the battery. The object of the cutout may be understood by use of the simple diagram given in Fig. 128. An electromagnet M has a winding of a large number of turns, and this winding is connected directly to the terminals of the generator. The resistance of the winding of this electromagnet is usually such that a very small current passes through it in comparison to the total current output of the generator. An armature A carried on a spring pivoted at its left-hand end and carrying a contact point on its right-hand end is mounted near the core of the electromagnet.

This armature is usually held away from the core of the electromagnet by means of the springs, and the movable contact point C is not in contact with the stationary contact point. The connections of the generator and battery are clearly indicated in the figure. Now as the pressure generated in the armature of the generator increases there will be an increase in the current in the winding of the electromagnet M, and the tension of the spring S may be so adjusted that the armature A pulls up the desired value. The tension in the spring S is usually so adjusted that the generator pressure is a little higher than the battery pressure when the circuit is completed, and the battery will always start to charge. When the pressure of the generator decreases, due to any cause, there is a decrease in the current in the winding of the electromagnet M and the magnet pull it produces on the armature A decreases in value. If the pull of the spring S exceeds the magnetic pull the armature will move away from the core of the electromagnet and the circuit between the battery and generator will be broken at the contact C.

The cutout whose connections and arrangement are shown in Fig. 128 would be satisfactory for closing the electrical circuit connecting the generator and battery, but would not open it properly in practice for the following reasons: In theory the spring S would pull the armature away from the core of the electromagnet when the electrical pressure generated in the armature of the generator dropped below a value which would produce the necessary current in the winding to hold the armature up. The following action, however, takes place in actual practice: When the electrical pressure of the generator exceeds the electrical pressure of the battery, the direction of the current in the battery, generator and winding

of the electromagnet will be as indicated by the three arrows in Fig. 129. If there is a decrease in the electrical pressure of the generator, due to any cause, or an increase in the electrical pressure of the battery and the two pressures become equal in value, there will be no current in the circuit composed of the generator and the battery.

If the winding of the cutout be connected when the pressures of the generator and battery are equal, a current will be established in the winding, which will be supplied jointly by the generator and battery, and the direction of the currents will be as indicated in Fig. 130. The division of the total current supplied the cutout between the generator and the battery will depend upon the relation betwen their internal resistances. When the electrical pressures within the generator and the battery are each exactly the same and their internal resistances are equal, then each of them will supply one-half of the total current in the winding of the cutout. If their internal resistances are not equal, their pressures being equal, then the one having the smaller internal resistance will supply the larger part of the total current in the winding of the cutout.

When the electrical pressure in the armature winding of the generator is less than the electrical pressure in the battery, then the battery starts to discharge and sends a current through the armature of the generator in the opposite direction to the pressure generated in the armature, as indicated in Fig. 131, thus causing a motor action to take place. The degree of this motor action will depend upon how much current is produced in the armature winding, which in turn will depend upon the difference in the pressure in the armature of the generator and the pressure of the battery, or the effective pressure, divided by the total resistance of the entire circuit. It is interesting to note that the battery will supply a current to the winding of the cutout and that the direction of this current in the winding of the cutout is the same as when it was supplied by the generator. This results in the armature of the cutout remaining drawn up, and the circuit between the generator and the battery will remain closed even though the battery is discharging through the armature of the generator. The cutout will remain closed at the comparatively low pressure of the battery when almost discharged, on account of the fact that it does not take as much of a current to hold the armature in place after it is once drawn up as it does to draw it up in the first place, when there is quite an air gap between it and the core of the electromagnet.

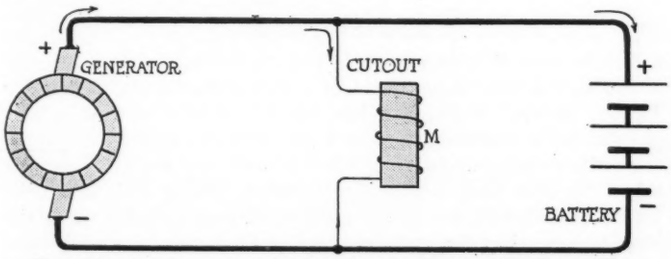


Fig. 129—Direction of currents when battery is charging. The electrical pressure of the generator exceeds that of the battery

The connections outlined in Fig. 132 are used in order to overcome the fault just pointed out. The cutout is provided with two windings instead of a single winding. One of these windings, M, called the shunt winding, is connected directly to the terminals of the dynamo, or rather the two leads from the dynamo, and the current in this winding will be equal to the pressure between the two main line wires divided by the resistance of the winding. The other winding, called the series winding, is composed of a smaller number of turns than the shunt winding and the wire used in this winding is usually quite a bit larger than the wire used in the shunt winding. The series winding is connected directly in the circuit connecting the generator and battery and carries whatever current passes through the battery. The connection of the series winding is such that the direction of the current through it is around the core of the electromagnet in the same direction as the current in the shunt winding when the battery is charging. When the pressure of the generator has built up to the proper value the shunt winding draws up the armature and the battery starts to charge.

Let us now consider what happens when the pressure of the generator drops below the pressure of the battery. Just as soon as the generator pressure becomes less than the battery pressure, the battery will start to discharge and the current in the series coil will be reversed in direction. The current in the shunt coil will, however, remain in the same direction as previously explained, which results in the magnetic action of the two coils being opposed to each other. Now, as the pressure of the generator decreases, there will be an increase in the discharge current from the battery and the magnetic action of the series coil will increase. Since the magnetic action of the series and shunt coils are opposed to each other when the battery is discharging, the difference in their effects or the resultant magnetic action acting on the core of the

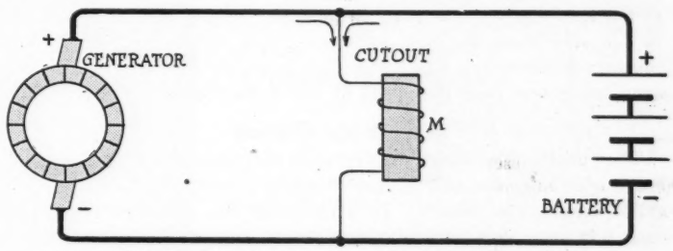


Fig. 130—When the electrical pressures of the generator and the battery are equal, the current to the cutout will be supplied by both, the difference depending on their internal resistances

electromagnet will decrease in value as the current in the series coil increases in value. The resultant magnetizing action of the two coils will be zero when the product of the number of turns and the current these turns contain is the same for both coils. The action of the spring S, however, draws the armature away from the core when the resultant magnetic action has been reduced to a certain predetermined value and the circuit connecting the generator and the battery is broken. In order that the circuit be closed again it is necessary that the pressure of the generator increase in value until ample current is produced in the shunt winding to draw up the armature.

The series coil performs another useful purpose, in addition to the above, in the satisfactory operation of the cutout. If a cutout

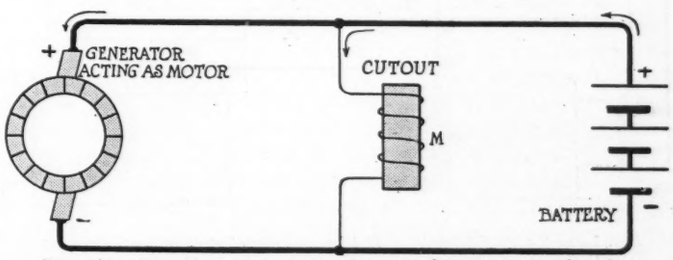


Fig. 131—Direction of current when the battery is discharging. The pressure of the generator has dropped below that of the battery

having only a shunt coil were made, there would be a tendency for the cutout to open and close at something like the same value of generated pressure. If the car were driven at a speed such that the generated pressure would result in the cutout opening and closing continuously, due to a more or less balanced relation between the magnetic and spring pull on the armature, the contacts would be seriously injured, due to the hammer action at the contacts and also due to excessive sparking. The series coil prevents this occurring in the following manner; the shunt coil acts alone in closing the cutout, as there is no current in the series coil until the cutout contact is closed and the magnetic pull of the shunt coil is just sufficient to overcome the spring pull on the armature when the armature is drawn up. As soon as the circuit is closed, assuming the adjustment is properly made, the series coil will assist the shunt coil in holding the armature. If the electrical pressure now decreases in value, the cutout contacts will remain closed until the

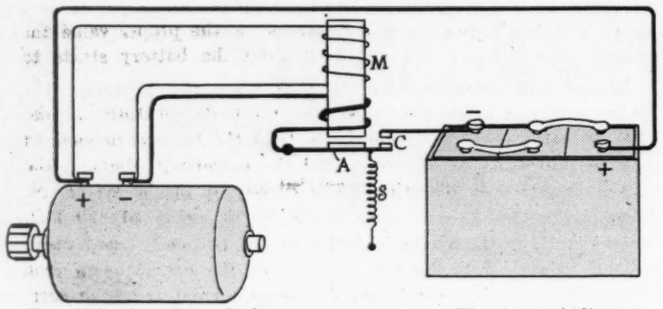


Fig. 132—Complete electromagnetic cutout. The two windings tend to equalize the pressure at the time of the opening and closing of the cutout

combined magnetic action of the shunt and series coils are equal to or a little less than the magnetic action of the shunt coil alone at the time the contacts were first closed. In practice the difference in car speeds at the time of closing and opening of the cutout contacts is something like 2 miles per hour, the speed at which they open being less than the speed at which they close.

Two-Pole Cutout

The cutouts described thus far have only one set of contacts and hence open only one side of the charging circuit. Such cutouts are called single-pole cutouts. In some cases the construction of the cutout is such that both sides of the charging circuit are opened and closed by the operation of the cutout. Such cutouts are called two-pole cutouts. An example of a two-pole cutout is shown in Fig. 133, which gives the wiring diagram of the cutout made by the Leece-Neville Co. There is a current produced in the shunt winding S which draws up the armature A and closes the two sets of contacts C_1 and C_2, thus completing the circuit between the

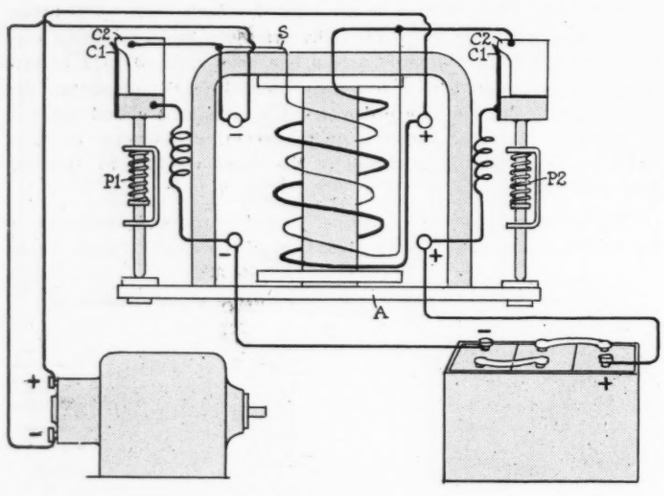


Fig. 133—Two-pole cutout. It is so constructed that both sides of the charging circuit are opened and closed by its operation

generator and battery through the heavy series winding around the core of the electromagnet. When the combined magnetic effects of the shunt and series windings is reduced, due to the decrease in the pressure generated in the armature of the generator, the springs P_1 and P_2 push the armature away from the core and open both sets of contacts, thus breaking the electrical connection between the generator and the battery on both the positive and negative sides.

Arrangement of Windings on Cutout

Separately mounted cutouts of the two-pole type usually have three terminals: one, marked D, leading to the dynamo only; another, marked B, leading to the battery only; and a third one, marked DB, which is attached to both the dynamo and battery. In the two-pole type of cutout there are usually four terminals; two go direct to the battery and two direct to the generator.

In the majority of cases the series and shunt windings are placed on the one single core; but in some cases two separate cores are provided, one for the series winding and one for the shunt winding; while in other cases two cores are provided and part of each of the shunt and series windings placed on each of the cores. The two cores on which the windings are placed may be located side by side or one may be placed above the other.

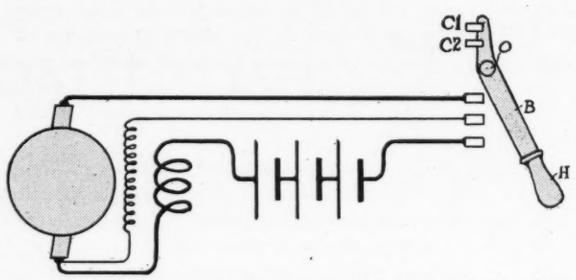


Fig. 134—Manual cutout showing position of switch, H, when the engine is idle

In some of the systems the arm that supports the movable contact point carries one or more of the electromagnets. A good example of a cutout of this type is the one found in the Adlake equipment. In this case there are two sets of electromagnets, one set being stationary and the other set movable. The mounting for the movable set of magnets carries one of the contacts, and this contact point makes electrical connection with the stationary contact when the movable magnets are drawn up against the stationary magnets directly above them. No spring is used to open the contacts, the weight of the movable magnets serving the purpose of the spring.

Location of Cutouts

The cutout may be found in any one of a number of different places, depending on the design and make of the equipment. In some cases it is mounted in a special housing provided for it and attached to the generator; it may be placed inside the generator frame in the brush and commutator compartment or at the space between the magnetic poles. The location of the cutout inside the generator or in a housing attached to it reduces the length of the wires between the cutout and generator to a minimum, and only two wires need be run from the generator in the two-wire system or one wire in a one-wire system. The cutout is sometimes located under the front seat, under the floor boards, on the front side of the cowl board, with the regulating device, or with the starting, lighting or ignition switch.

Manual Cutouts

In the manual type of cutout the connection between the generator and battery is controlled by a switch that is attached to the button, handle or lever of the starting switch or the ignition switch. It is customary to attach the ignition switch to the starting switch when this type of cutout is used, and for this reason it might be said that a manually operated cutout will always be interconnected with the ignition switch in such a manner that the circuit connecting the generator and battery will be closed when the ignition circuit is closed and opened when the ignition circuit is opened. A diagrammatic representation of a system of this kind is shown in Fig. 134. The switch in this case is composed of a curved blade B provided with a handle H and pivoted at the point O. The position of the handle shown in the figure corresponds to an idle engine. The two contacts marked C_1 and C_2 are for the purpose of grounding the magnets and thus cutting off the ignition. The dynamo in this case operates as a motor when the main switch is closed, the shunt and series fields acting upon the magnetic circuit in the same direction. As the machine speeds up, the pressure in its armature will increase, and when it exceeds the pressure of the battery, the battery will start to charge. When the battery is charging, the shunt and series magnetic fields act on the magnetic circuit of the dynamo in the opposite direction with respect to each other. The switch may be placed in a position between the two extreme positions, which results in the ignition being operative but the battery entirely disconnected. The shunt field is also opened, which prevents there being a pressure generated in the armature of the generator.

Pennsylvania's Road Sponsor

THE average motorist in passing along some roadway is so enraptured by the surrounding scenery or is so desirous of reaching some point mapped out on the itinerary as to be unconscious of the early influences which made travel on our highways possible.

If we were to seek those early influences to write the history of good roads the name of Robert P. Hooper would be prominent throughout the work, until it became synonymous with good roads itself. Every little by-way and highway throughout the country bears the earmarks of motor car development. The roads of 20 years ago that were used for wagons and foot travel have since been converted into navigable highways and have lifted the motor car into America's leading institution of pleasure and industry. With the coming of the motor car came better roads, and with better roads came more motor cars.

Robert P. Hooper was among the first to realize what good roads meant, and his interest has not subsided one particle with the realization of his dreams. He is an apostle of the belief that keeping everlastingly at it brings success, as applied to good roads.

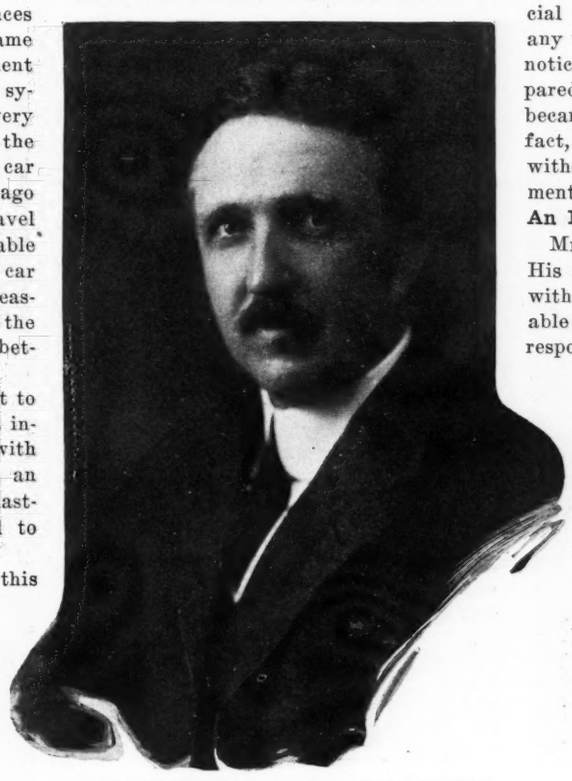
The first good roads movement in this country had its inception at Springfield, Mass., in 1900. Mr. Hooper, who at that time was vice-president of the American Automobile Association, was made chairman of the committee. From this gathering of disinterested men was started the national movement which has taken a firm and lasting hold on every state and every community, and did more to further the interest of the motor car than any other movement. The committee worked as part of the A. A. A. In recognition of his good work and untiring efforts Mr. Hooper was made president of the national body. He held this coveted position 2 years.

Mr. Hooper is a Philadelphian. He has been a member of the Pennsylvania Motor Federation for 9 years, and its president since 1908, being re-elected at each annual meeting. He succeeded Isaac Starr, also of this city, who was the first president of the federation.

How State Highways Started

With Samuel Ray, Mr. Hooper was the first to conceive the thought of a highway across Pennsylvania. That was under Governor Stuart's administration. The bill which was introduced into the legislature, appropriating $5,000,000 for that purpose, was vetoed, but even though the movement failed to materialize it was largely responsible for the great network of highways in this state. Other measures had eaten up all the available money in the state treasury, so that the Stuart highway, as it was to be known, was dropped.

Mr. Hooper was undaunted in this as in other propagandas and has been active each legislative session in securing the enactment of laws favoring more and better roads, and was active in having established the motor car division of the state highway department, which has done an inestimable amount of good in this direction. He vigorously fought against the enactment of laws that were antagonistic to the motorist, and it must be remembered that in the beginning the state assembly was flooded with all kinds of bills, good, bad and otherwise, all of which marked the phenomenal growth of the industry.



Robert P. Hooper, Pennsylvania's road builder

Through his influence Governor Miller of Delaware put through the mutual reciprocity act in that state, granting to foreign tourists the right to spend unlimited time in Delaware. It was through no fault of Mr. Hooper that this law became a dead letter soon after.

During his presidency the federation increased in size from fifteen motor clubs with a membership of 1,800 to sixty clubs with a combined membership in excess of 11,000. A communication from Secretary Paul C. Wolff has this to say of Mr. Hooper: "We feel that much of the success of the federation along both good roads and legislative lines is due to the personal and untiring efforts of Mr. Hooper and the influence he has been able to bear that has been so essential for success."

While the federation has never advocated freedom from proper restriction for motorists it has been able to bring about a vast improvement in the motor laws of Pennsylvania which, while they freed the car owner from many unnecessary drawbacks and annoyances, at the same time added to the safety of the public in general. Owing to careful management the federation has always been in good financial condition and well able to carry on any work it finds necessary at a moment's notice. That Mr. Hooper was a "preparedness" advocate even before the word became so popular is evidenced by this fact, and the federation has never been without funds to champion a good movement or defeat a bad one.

An Extremely Busy Man

Mr. Hooper is an extremely busy man. His duties are varied, and although never without plenty of work he is always amiable and always willing to shoulder more responsibilities. He is treasurer of Hooper & Sons, Philadelphia, and president of W. P. Hooper & Sons, Baltimore. He is a director of the Automobile Club of Delaware, a member of the garage committee and a charter member of the Automobile Club of Germantown in addition to being its president for 3 successive years.

On Mr. Hooper's desk in his office at Juniper and Cherry streets is a photograph of a grandfather's clock. The original was presented to Mr. Hooper in April, 1915, as a "token of affection and appreciation of his interest and zeal in behalf of the motorists of Pennsylvania."

NEW TRUCK COMPANY

Detroit, Mich., Oct. 24—Organization of a holding company in New York to be known as the United Truck and Equipment Co., with incorporation in Michigan to operate the United Motor Truck Co., is being perfected. Other companies may be controlled by the holding company, possibly including the Republic Truck Co., of Alma. Capitalization of the new company will be more than $400,000 and it is understood that $60,000 will be common stock.

MOTOR TRUCK BATTLE FLAG

Kenosha, Wis., Oct. 24—What is probably the first battle flag ever designed and used by a motor truck company in the United States army is now being proudly displayed in the Nash factory. Members of truck company, No. 1, U. S. A., which consists of Jeffery Quads, sent the emblem to H. C. Hart, truck sales manager of the Nash organization.

In each corner of the flag there is either a pair of crossed American flags or a spread eagle, while across a blue circle on a red back ground appear the words "Jeffery Quad" in white lettering. "Truck Co. No. 1" is inscribed over the circle and "U. S. A." beneath it.

From the Woman's Viewpoint

Grand American Draws Many Women

Speed Proves Stronger Attraction Than Fashion, However, and Crowd Follows Contest Closely

When Aitken got the lead on Resta, then things whooped up even more

CHICAGO Speedway, Oct. 14 — More than a few women found the grand American race at Chicago speedway a magnet of unusual drawing power. Stage for a decisive battle between the four leaders in the 1916 championship contest and fit sport for an ideal autumn day, the oval had as spectators not only Chicago women, but women in parties from out in the state and from neighboring states.

From the crowd's standpoint, the race was a social success as well as the best race ever. It brought disappointment, however. The grandstands were rooting for de Palma, but even their support, wholehearted as it was, could not keep away the jinx, with his usual line of hard luck.

Like the proverbial Roman crowd, the American crowd does not always cry "thumbs down" for the loser, and this was the case when the general favorite came into the pits for the last time and his rivals swept by. For many had come out to see de Palma win, and they could not easily accept another winner. All of which recalls the grand prix race on the Chicago speedway August 19, in which de Palma retired with a broken cylinder and one disappointed feminine adherent in the grandstands loudly demanded why the manufacturer of his racing car was so careless as to have no other cylinder at the pits ready to slip in so de Palma could go on and win. The grandstands took some time to get over this destruction of their hopes.

This was a good day for a social success. Coming as it did after days so unfavorable and wet as to bring official postponement of preliminary trials, the contrast emphasized the clear sky and the temperate air. Those who wished to be in vogue of dress could do so without unseemly display of new coat and hat, and in certain corners of the speedway the race approached a fashion show by some other name.

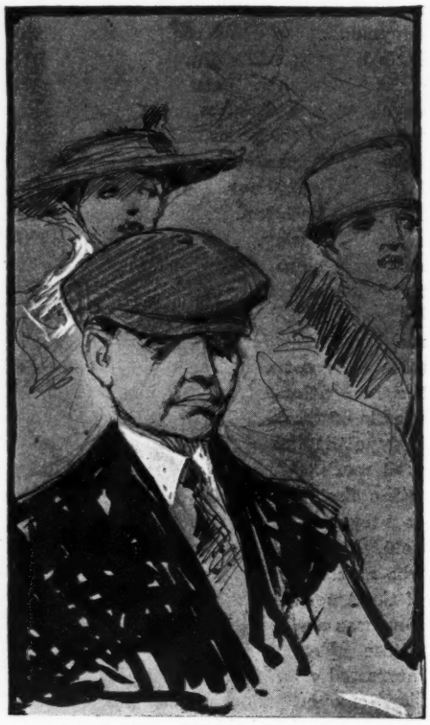
Fur Was There in All Its Glory

To prove that the constant admonitions of fashion dictators who prophesied fur and yet more fur would be worn this winter have had some effect through their repetition, if not otherwise, fur was there in all its glory. Even down to a tiny 2-year-old, who wore a coat that seemed far too frail to support fur-trimmed sailor collar, fur neck piece, fur cuffs and fur hem. Fur shoulder collars, those recent additions that lie flatly on the person, made merry with cloth suits and velvets.

Summer and early fall were not absent. Lace straw hat and fur cape go well together, especially if they are accompanied by cerise or some shade of rose. One dress suit trimmed in luxuriant fur was of a wine color. Reds are predominant this season, anyway. Burgundys, Bordeaux and other wine colors, as well as beet and brick reds add cheer to any scene, and for this reason are happy choices for the dull months of outdoor rest.

The men, though, prefer green, or else their tailors do, and green hats, green scarfs, green coats and green suits were abroad in the speedway. The color goes well in opposing the red. This may explain the coincidence of the two. Absinthe and wine, though, are strong servants, and it is not every man and woman who can wear them in the full intensity in which the new shades are offered.

The race was a fair clothes example of the ardent pursuit of sports of every kind promised for this winter. Sweater suits will be in demand, and one or two appeared here. Clothes were present, but not conspicuous; this would make a good summing up of the day in that respect. The crowd was more interested, apparently, in the race itself and the attendant thrills than in what a neighbor wore. As the hard-fought contest between Resta and Aitken was decided by the checkered flag and the long wind-up of the followers brought a pause in the day's occupation early leavers passed a regular gamut of inspection on their way to train or cars. Then were seen the long plaid coats, the heavy fur pieces and high-booted footwear of the boulevard.



When Resta got the lead on Aitken, the grand-stands had to get used to it

The parked cars adjacent to the officials' stand contained more well-dressed women en masse than the grandstands, for looking over the grandstands themselves, the subordination of dress to the occasion was evident. A greater part of the holders of the general admission seats were men, plainly there for the race only. The boxes held some well-dressed women among its men, who were here in the majority also, and the rows here and there gave back

some note of new color or material. Bareheaded girls gave a new note to the gathering. Perhaps college girls who had chosen the race instead of the football game, though far be it from this article to even hint disloyalty to their school.

Everywhere were sportsmen and sportswomen. That is the impression the grand American would probably give most general observers. A finer, better set up assembly of open air sports enthusiasts probably gathers nowhere else. Motoring tends to give this quality to those who motor, and most of the crowd were motorists, if the parking space can bear witness to it. For back of the stands cars were parked within touch of each other along practically the entire stretch there. Enterprising guardians at the entrance to the speedway reaped dollars for space in vacant fields nearby, vacant fields that were well filled by 2 o'clock. As usual the allotments infield showed many cars, the occupants of which divided their time between the stands and the cars themselves.

Race Sets New Incentive for Attendance

The attendance at the race is judged as below par. It is regretted that more did not see the birth of this particular race, the grand American. But if such another race as this of today is ever foreseen in the announcement of an event at the Chicago speedway, the fame of the performance today will guarantee a record-breaking gathering. Such is the opinion of the grandstands, expressed by its behavior.

"Gee!" breathed one small patron of the infield, who had got in through some slight service, judging from the fact that he came afoot, unattended and in business garb. This was after the crowd's applause had been reluctantly transferred from de Palma to Resta and Aitken in their struggle for the leadership. And he said it all, as the descriptions of the race and its course will tell you.

From the beginning to the end, interest in the oval itself was keen. For the first 192 miles, during which de Palma led, interest was centered in willing him there, and when the end of these miles brought disaster, it also brought new food for thought and from then on events came too fast for let up of tension.

Through it all, however, edibles disappeared. The lack of confetti, that attendant of most revelry, was not felt. Peanuts took its place. There is an art, seemingly, in eating peanuts, and this art the American crowd has conquered and made its own. It follows: First, the peanuts, the more the better, for then some may be spilled down the back of whoever happens to be in your immediate foreground. Then, taking a single guber, hold it lightly with two fingertips of each hand. A sleight of hand of the wrist, and the exact center parts, scattering the fine chaff from its interior to the four winds. Like its colleague, confetti, it takes unto itself all the creaks and hollows in the garments within reach.

But nobody minds the confetti. And nobody minded the inveterate peanut consumer today. It was a good-natured crowd, as usual, and it would have been jollier even had not the nature of the few accidents of the race been such as to cause its sympathy. Common consent agrees that the subway beneath the oval shall not be criticised but given sympathy for the presence of water beneath its floorway. And, though many of the new light kid boots now in vogue picked careful path among the waters, it was all taken as part of the day, and not such a bad part at that. The management, by the way, pumps this water out as fast as it collects, but so far has been unable to prevent it from collecting.

In this way does the race crowd today show its good nature and the sportsmanship that accompanies good nature. And as the train travelers hunt for seats in the crowded trains back to the city and the motor car travelers start and stop in long line of many blockades and delays, leaving behind them the officials winding up today's race, it is a satisfied crowd, that will come again when the speedway so arranges.

Beauty Hints for the Woman Motorist

No. 11

A RED nose is a bugbear to a great many persons, and the approach of cold and damp weather magnifies the bugbear. With the fresh air the motorist gets in the course of her motoring and the precaution of veils she usually observes, a red nose should be a stranger rather than a common acquaintance to her. Nevertheless, and being a bugbear, a red nose is no respecter of persons or methods of locomotion, and the motorist knows its undesirable presence too well.

Not to be overlooked at the grand American race at the Chicago speedway was this same bugbear, that bane of all motorists and partner of all harbingers of winter cold and wind. Not that it was so noticeable as to intrude itself upon the consciousness of all who ran, but just beginning its busiest campaign of the year and starting with a few voters here and there.

Unfortunately, the red nose is to be far more noticeable later. It was attacking enough even then to furnish warning and give strong hints that now is the time for every woman to come to the aid of her circulation if she would avoid such color.

A red nose is not a necessary evil; it is only an easy evil. The October breezes need bring no alarm, for the chill of later months and the sting of later winds will bring no hectic flush to you if you take steps of prevention first. The remedy is rather exacting, however. A course of training such as the football teams are now following is compulsory before tendency to such possession can be checked. One must live the life of an ascetic to ward off the redness, eating carefully and eating foods that are rich in iron and thus stimulating to the circulation.

Creams and lotions cannot cure of themselves here; few ills of the skin can be cured by them alone, for that matter. Diet is the first requisite. Usually the red nose comes from one cause only—inactive circulation of the blood. You must no longer eat bonbons, chocolate cake, rich puddings, sauces and pastries if you would enter the training that has as an end the abolishing of the red nose. These bring another cause, a sluggish liver.

Fruits, salads and vegetables should form the major portion of your diet. Meat is permissible only once a day. Eat plenty, but never too much. Foods with much iron are: Spinach, which has, perhaps, the greatest amount of iron; peas, beans, onions, prunes, lettuce, and celery. The iron builds up the red corpuscles of the blood.

If you are at all inclined to be anemic, that is, lacking in vigorous blood, iron is necessary, and if you go to a physician that is what you will get in the tonic he gives you.

Paris Has Doormat Fad

Now that the interior of a closed car is fitted up with delicate trimmings and carpets like a woman's boudoir, the old admonition to "Wipe your feet, Henry!" is much in order. Many cars are of this nature, and the advantage of keeping dust and mud off the floor is becoming more apparent as the fittings develop delicacy and finish. Yet, anyone stepping into a car from the street cannot help carrying a little dirt in with him on his shoes.

Paris has originated an idea that is merely a materialization of "Wipe your feet, Henry." It should also be popular in the larger cities of the United States. A small piece of stout doormat is neatly cut and edged; then it is strapped to the running board just below the door opening.

The mat could be sewed to metal pieces and screwed to the running board or fixed with screws and washers so that the heads of the screws would be buried deeply in the mat. At any rate, the idea is so simple and easy of application any car owner can adapt it to his own use. Then will the car interior be but another part of the home, indeed, and no longer will the housekeeper—or would driver be best here?—of the car need to remind Henry.

The Readers' Clearing House

Maximum Motor Speed Figures

EDITOR'S NOTE—In the October 12 issue of Motor Age, in this department, the statement was made that maximum speed figures would not be given in these columns unless the car and model in question had been driven in an official test under the observance of the American Automobile Association, to obtain an official figure of maximum speed.

Motor Age readers may now consider an addition to this with relation to the maximum revolutions per minutes of the motor.

In the first place, the maximum revolutions per minute is never the figure at which the maximum power is obtained. In most inquiries the question is, merely, "what is the maximum r.p.m. of such and such a motor?" It is our belief that most of the inquirers want to know at what motor speed the maximum power is obtained. We are at a loss, therefore, for an answer to give them.

Furthermore, maximum r.p.m. is a variable. Just as in maximum miles per hour speed, this motor speed may be considerably different in two motors of exactly the same model.

What engine-speed figures are available come from the factories and are made with the motor, tuned to perfection, operating on a block. It is not reasonable to suppose that the same motor will perform the same way in a car. There are readers who will take this maximum engine speed figure and with the gear ratio and wheel diameter figure out what the maximum miles per hour of the car would be. If their cars will not obtain this speed, which they will naturally not come anywhere near doing, they are disappointed. Friction seems to be forgotten.

Ignition With Relation to Explosion of Gas

WALSENBERG, Colo.—Editor Motor Age—Kindly give a cut of a piston on the compression stroke with the lines showing the different degrees of advance and retard of the spark with an explanation showing why the increased momentum of the balance wheel calls for advance of spark. Also, why a retarded spark overheats the engine when the speed is too fast for the late time of spark, i. e., explaining why the spark entering the expanding gases at retard, heats the cylinder walls more.

If you will explain this you will no doubt enlighten a great many people who are under the impression that the spark cannot be timed to enter the gases before the piston has reached the end of the compression stroke.—B. H. Carpenter.

If ignition of the whole charge took place instantaneously the top of the stroke would be the proper time for the spark to occur. It has been shown, however, that it takes some time for the flame to be propagated through the charge, and for this reason, when the motor is running at relatively high speed the spark must occur slightly before the top dead center for the best results.

At low motor speeds with the gas burning at relatively the same rate of speed there is more time for the burning to take place, therefore, the explosion can take place later.

Upon ignition, the pressure in the cylinder suddenly rises to between four and five times what it was previously, and the piston is forced under this pressure.

THE THEORY OF SPARK TIMING

Combustion of Gas Performed at Constant Speed—Motor Speed Variable

Consider a motor running at 150 revolutions per minute. With the spark retarded the spark plug fires with the piston in the neighborhood of 12 degrees beyond top center, see Fig. 2. At this slow motor speed the initial burning of the gas sends an impulse to the piston before it has traveled over a fraction of an inch and the expansion then follows the piston down near the bottom of its stroke. Now suppose the spark is set ahead. The plug fires before the piston is at top center and as the piston travels but a fraction of a second before the burning gas exerts pressure on it, there is a vigorous pressure thrown against the piston before it has become offset from the connecting rod and a knock occurs.

Now suppose the motor is running 1,500 revolutions per minute. With the spark fully advanced the plug fires shortly before the piston has reached top center. The gas burns at approximately the same speed, but the piston has traveled ten times as far before the explosion pressure effects it as it did when the motor was running 150 revolutions per minute. Therefore the pressure comes when the piston is just beyond top center, which is the ideal time. Now suppose the spark is retarded with the motor running at this speed. The plug fires when the piston is at top dead center, but the pressure does not reach the piston until it has traveled ten times as far as it did with the motor running at 150. The gas starts burning late, in fact, continues to burn with the piston on the up stroke and heats the cylinders. The illustrations are, of course, very much exaggerated to show the effects more clearly.

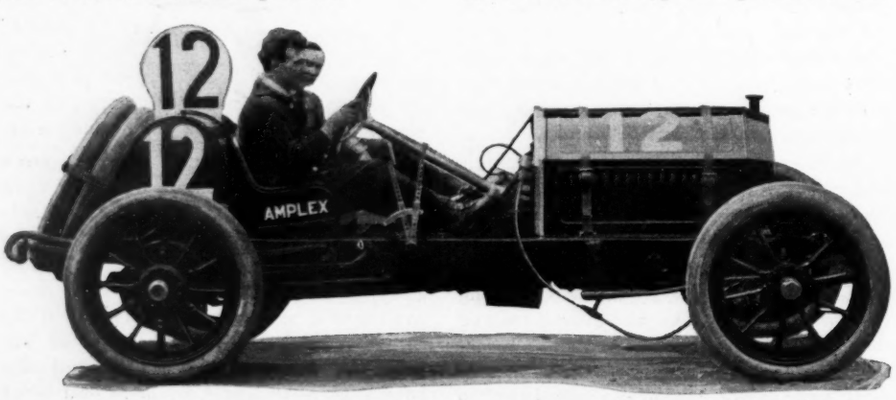


Fig. 1—Amplex car which was an entry in the 1911 Indianapolis 500-mile race

THE 1911 AMPLEX RACING CAR

Photograph of Indianapolis Entry Given —No Specifications

Columbia, Mo.—Editor Motor Age—What company manufactured the Amplex car?

2—Where can parts be obtained for these cars?

3—Please give the specifications and picture of the Amplex racing car entered in the 500-mile race at Indianapolis in 1911.

4—Was the Amplex company connected in any way with the Simplex company?—F. W. Niedermeyer, Jr.

1—American Simplex Co., Mishawaka, Ind.

2 — Amplex Auto and Machine Wks., Mishawaka, Ind.

3—The Amplex car entered in the 1911 Indianapolis 500-mile race was a four-cylinder of 5 5/16 bore and 5 inches stroke, two-cycle, with a mechanical oiler, single Bosch ignition, Schebler carbureter, disk clutch, with three-speed gearset on the rear axle. The car is illustrated in Fig. 1.

4—No.

WIRING A FORD FOR SPOTLIGHT

Current Should Be Taken Directly from Storage Battery to Gang Switch

Duluth, Minn.—Editor Motor Age—Publish a wiring diagram for Ford cars using the gene-motor starting and lighting system. I have recently installed one of these on my 1915 Ford, but the diagram sent provides for head and tail

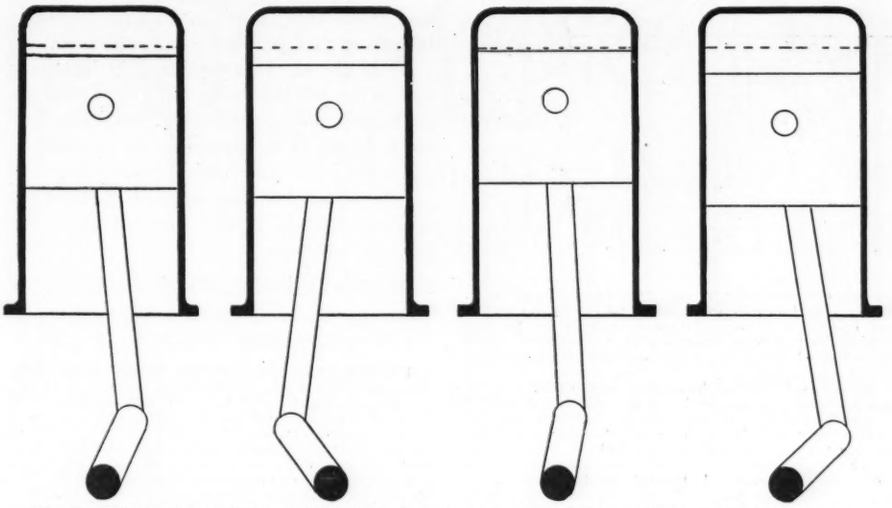


Fig. 2—The first two figures at the left show in exaggerated form, first, the moment of effective firing with the motor running at low speed and the spark retarded; second, the moment of effective firing with the spark advanced. The second two diagrams represent, first, the moment of effective firing with the motor running at high speed and the spark advanced; second, with the spark retarded. Effective firing is when the explosion pressure takes effect

light only and operates on one switch. I should like to install side, tail and dash lights all on one switch and that to be the old switch that formerly controlled the lights from the magneto, but which is not now used.

2—Should also like to have included in the diagram connection for spot light and horn to be connected up later, and finally kindly advise me if my battery will carry all this extra load without trouble.—Morelite.

1—The best way to connect up side, tail and dash lights together with spot light and horn to this system is to install a gang switch with enough switches to take care of each of the items you add. The gang switch should take its current direct from the battery as shown in the addition to the wiring diagram, which is shown in Fig. 3. You cannot utilize the old switch.

2—Whether your battery will carry this extra load depends entirely on you. We suggest that you read the article on page 5 in the October 5 issue of Motor Age. For winter driving especially you would have to humor your battery considerably.

DIFFICULTY WITH SELF STARTER

Battery Seems to Leak—Probability Is Jar Is Cracked

Grass Range, Mont.—Editor Motor Age—I have had considerable trouble with the self-starter and battery on my 1916 Studebaker runabout. It seems impossible to keep it charged and it always leaks. It has been charged at a station twice, has run only about 2,500 miles, and most of the time the battery will not turn over the engine. What is the cause and the remedy?—F. E. Charters.

1—If the service station is a reliable one and has found the electrical system to be in first-class condition, the trouble probably lies in your method of handling it. We refer you to the article on page 5 in the October issue of Motor Age, which explains the necessity of handling the electrical system literally with silk gloves. There are so very many things that could effect the system in this way that we could not well enumerate them in these columns. You say it always leaks. If you mean the battery is always leaking you do not have to look any farther for your trouble. A leaking battery very naturally means a discharged battery. If your battery leaks write the manufacturer and ask him where to send it to get a new jar for the one which is undoubtedly cracked. Do not try to change the jar yourself.

PUTTING A BATTERY ON A FORD

Reader Desires to Have Interchangeable Lighting System

Cincinnati, O.—Editor Motor Age—Will you give me a diagram for a lighting system for a 1913 Ford car, the lights to be run from a storage battery?

2—Is it possible to have wiring so that if the battery is weak the lights can be run off the magneto until battery can be charged and, if possible, will you give me a diagram?

3—What is the fastest stock car in America?

4—What is the speed of the Fiat?—A. Schirmer, Jr.

1—Fig. 4 shows the simplest method of wiring to take care of lighting your Ford from a storage battery. The three lights are grounded to the frame of the car as is the negative terminal of the battery. The regular Ford lighting switch is utilized.

2—If the car is equipped with the coil box which has one terminal for lights, horn, etc., a wire may be attached to this and taped up somewhere out of the way. Then if you desire to run the lights off of the magneto when the battery was being charged you could disconnect the battery wire from the regular Ford switch and attach this magneto wire in its place. If you have a 6-volt battery you will have to use 6-volt bulbs and then if you change to the magneto for lighting you will be obliged to exchange these 6-volt bulbs for ones of 12 volts.

3—As far as official records are concerned the fastest stock chassis is the Hudson Super-Six.

4—There are no official records of the speed of this car.

TEMPERATURE AT EXPLOSION

Thermal Efficiency a Factor to Be Considered in This Case

Argenta, Ark.—Editor Motor Age—What is the temperature inside the cylinder of a gasoline engine at the time of explosion?

2—What is the pressure at time of the explosion?—E. A. Campbell.

1—Depending entirely on the general design of the motor. Probably between 1,200 to 1,800 degrees Fahrenheit.

2—Depending on the motor's compression. With a motor compression of about 75 or 80 pounds per square inch, the explosion pressure would range around 300 to 400 pounds per square inch.

TIMER POINTS BURN BLACK

Caused By Improper Contact Which Is Due to Arcing

Orlando, Fla.—Editor Motor Age—Advise where I can procure repair parts for a Remington car.

2—Explain why the points on my timer burn black. This car is equipped with a Lycoming motor, Apple electric starting system and an Atwater Kent ignition system, the points are tungston. Would it be advisable to get another timer, or can this one be repaired, as I have always had trouble with this one.—J. R. Reaves.

1—Repair parts may be procured of the Remington Motor Co., Kingston, N. Y.

2—The points are either too far apart or do not fit properly one against the other. If the points are so fitted and adjusted that the contact is not perfect over the entire surfaces of the points, the current will arc across the points that do not touch and cause the black deposits of mica. This is explained in the article on page 5 in the October 5 issue of Motor Age. The points should be removed and ground down to a perfectly flat surface, then replaced and adjusted so that a firm contact will be made.

Gauge for Oil Pressure

Indianola, Miss.—Editor Motor Age—I have a Chalmers car which has a pressure gauge system for oil. If the motor base gauge shows

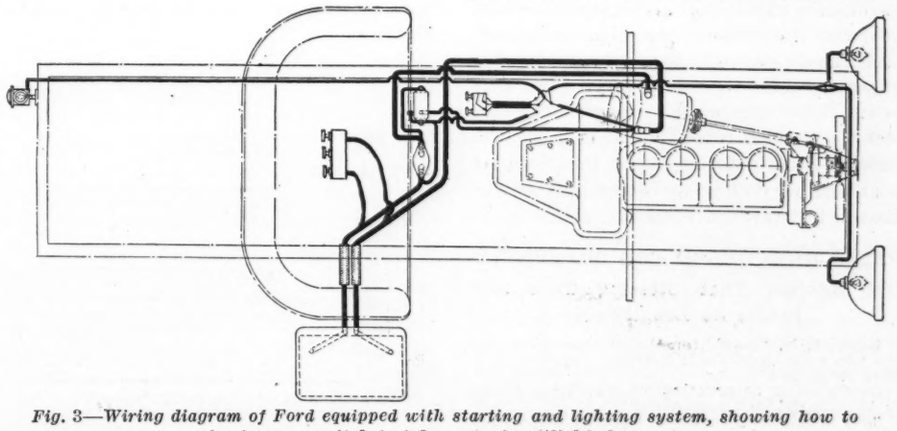


Fig. 3—Wiring diagram of Ford equipped with starting and lighting system, showing how to wire to gang switch to take care of spotlight, horn, etc.

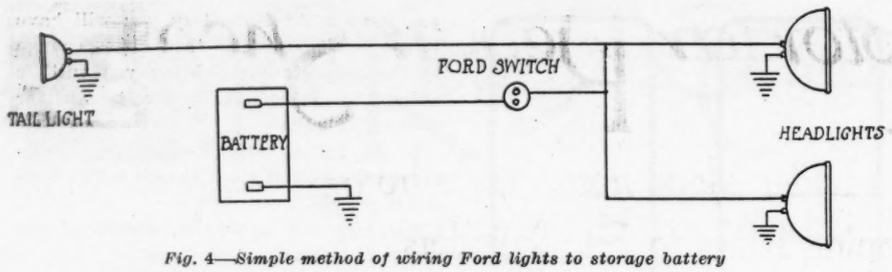


Fig. 4—Simple method of wiring Ford lights to storage battery

nearly full the oil pressure gauge needle registers the pressure. If half full this pressure gauge does not register. Does this mean that the oil does not circulate, or does it circulate insufficiently to register?—D. L. Bingham.

1—When the pressure indicator does not register, the oil system is not operating. The gauge in the oil reservoir should never be allowed to show as low as one-half or one-quarter full. Oil should be kept up to between three-quarters and full at all times. It is advisable, any time the pressure gauge does not register pressure when the motor is accelerated, that the condition causing the same be corrected.

WIRING BATTERY CHARGE PLANT

Diagram Showing Connections to Make in Using Delco Equipment

El Paso, Ill.—Editor Motor Age—Which is the best floor for an unheated garage, concrete or board?

2—I have a 32-volt Delco lighting plant. How may I use same to charge by car battery? It is a six-volt Willard battery—R. R. Dunmire.

1—Each has its advantages and as far as the heat element is concerned there is little preference. Cold does not injure rubber. Therefore, concrete which is less conductive than wood and retains cold longer will not injure the tires. An advantage of concrete over wood is that it may be flushed and all grease removed, while wood will absorb oil and this is harmful to tires.

2—A wiring diagram with instructions printed on it is shown in Fig. 5.

PERCENTAGE OF GAS WASTED

Only About 22 Per Cent of Energy Goes to Rear Wheels

Harrisburg, Ill.—Editor Motor Age—What per cent of the gasoline that goes into a cylinder is burned and what per cent is wasted? I have been told that 22 per cent is burned. Is this correct?—A. J. Dornseif.

1—The percentage of the gasoline which is burned is far higher than you have been told, but it varies to such a great degree depending on the design of the motor, the carbureter adjustment and many other reasons that a definite or even a fairly approximate figure cannot be given. Probably what the party tried to convey to you was that about 22 per cent of the energy in the fuel went to the rear wheels. This is true. The energy from gasoline is in the form of heat and very close to 75 per cent of the heat is lost through radiation, etc.

PAIGE REMODELED FOR SPEEDSTER

Not Advised That Steering Tube and Pedals Be Lengthened

Berwick, N. D.—Editor Motor Age—How are the two main crankshaft bearings adjusted in a 1912 Paige 25?

2—Would it be practical to remodel a Paige 25 1914 model into a speedster?

3—I would like to set a seat on the frame about 2 feet from the rear end of the car and would like to know how it would be possible to lower the steering wheel and also lengthen it. I will also have to put some kind of an extension on the foot pedals. How would it be to use piping in between another set of pedals? You see where I want to set the seat will be too far to reach the pedals.

4—Would this car have any more speed if converted into a speedster? If so, how much more?

5—Would the oiling system on this car be enough for speeds on high as 50 miles an hour or for racing on small dirt tracks? There will not be much expense to this, as I have a repair shop of my own. I intend to leave the c geared just the way it is at present, as I will only race occasionally. The present body is of an old type and too heavy for this motor.—H. W. Arnold.

1—No provisions were made in this motor for taking up the main bearings. If these bearings wear excessively, the only remedy is to install new ones, fitting them up as tightly as possible.

2—Yes.

3—Why put the seat so far back? Your car would be hard riding and generally out of balance. You will find that the steering gear will drop down to any angle and it is suggested that the seat be located to come the correct distance behind the wheel when it is dropped down, say eight or ten inches. It would be an expensive proposition to try to lengthen the steering post and the levers inside of it, and the same is true of the pedals.

4—If the car was considerably lightened by taking off the body, etc., it would undoubtedly be considerably faster. How much faster it is impossible to estimate.

5—Yes. If you intend rebuilding the car for speed purposes you surely want the seat more than 2 feet forward from the rear of the frame.

Communications Received and Inquiries Answered

B. H. Carpenter.....Walsenberg, Colo.
F. W. Niedermeyer, Jr....Columbia, Mo.
Morelite.....Duluth, Minn.
F. E. Charters.....Grass Range, Mont.
A. Shirmer, Jr.....Cincinnati, O.
E. A. Campbell.....Argenta, Ark.
J. R. Reaves.....Orlando, Fla.
D. L. Bingham.....Indianola, Miss.
R. R. Dunmire.....El Paso, Ill.
A. J. Dornseif.....Harrisburg, Ill.
H. W. Arnold.....Berwick, N. D.
Horace Willey.....Independence, Ia.
H. D. G.....New Braunfels, Tex.
John B. Fenollo.....Manette, Mo.

No communication not signed by the inquirer's full name and address will be answered in this department.

TROUBLE WITH CASTOR LUBRICANT

Difficulty Probably Due to Oil Coming in Contact With Air

Independence, Ia.—Editor Motor Age—I desire some information regarding the use of castor oil as a motor lubricant. I understand that it is used to some extent in racing cars. I have a 1915 Saxon six, and having several gallons of castor that had been purchased for use in a stationary engine, decided to use it. It would not go through the screen in the oil sump at high speed and after the car had set over night it was so gummed up that it had to be put in gear and towed to turn it over. I then put in several gallons of kerosene, which loosened it up temporarily, but did not remove it. I have the car soaking with denatured alcohol, which seems to cut the gum.

Does castor oil act that way always, or is the oil spoiled?—Horace Willey.

1—Castor oil is an excellent motor lubricant. In drug store form its price is prohibitive. However, it may be obtained in a grade suitable for motor car use and well within the pocketbook in Sexton castor or castor Oilzum.

Probably the castor you tried to use had become gummed up and rancid from standing long and possibly being exposed to the air. Good castor oil will never act in the way you describe.

Year Marathon Was Built

New Braunfels, Tex.—Editor Motor Age—I have a Marathon car model W No. 5203. I would like to know what year this car was built.

2—What kind of lubricating should the three speed gears have, that is, dope or oil?

3—Is the Marathon Motor Works, Nashville, Tenn., still building the Marathon car?

4—What horsepower has the above car and what speed is it possible to make under best conditions?

5—Can a copy of Motor Age be had in which this particular model was described in detail and what price and where?—H. D. G.

1—In 1914.

2—A very heavy flowing oil. Do not use grease. The gears are liable to run dry.

3—No.

4—The N. A. C. C. horsepower rating is 29. There are no official records of the speed of this car.

5—No. The supply is exhausted.

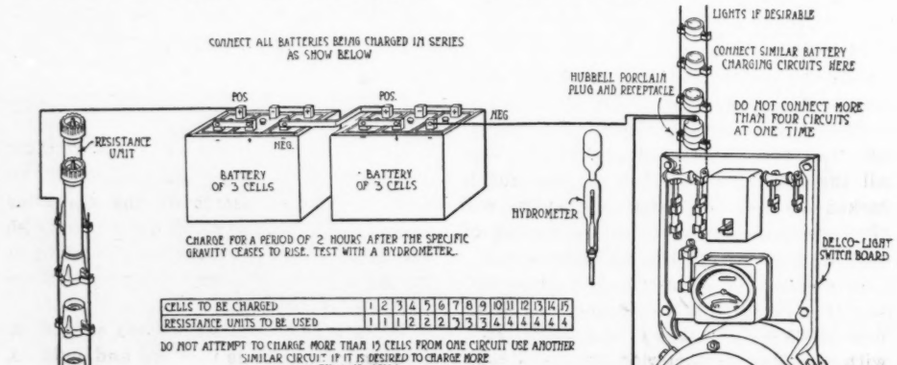


Fig. 5—Diagram showing connections to make in use of Delco battery charging equipment

The Motor Car Repair Shop

Oil Can Holder Made from Angle Iron— Lapping Rings to Fit Cylinders

OIL cans in the tool box or under the rear seat cushion are not only inaccessible but are very liable to overturn and spill oil all over tools, side curtains, etc. An oil can holder, which may be bolted to the frame or some other accessible place under the hood, is illustrated in Fig. 1.

This holder is constructed of angle iron —1-inch stock is a good size. One piece about 12 inches long should be cut as shown in the top sketch with a V notch about 4 inches from the end. Another piece, 7 inches long, should also have a notch cut the same distance.

The notched space should then be closed, which forms the angle irons into the form as shown in the bottom sketch. The oil can should then be located between the two irons so that the angles in the iron clamp the can evenly on each side. With this done the location should be marked and a ¼-inch hole drilled through the end of the short iron and the spot on the long iron where the former is to be located. A ¼-inch cap screw or stove bolt will serve well to join the two at these holes.

Holes $\frac{1}{16}$-inch diameter should be drilled through both irons, about 1 inch back of the V notches and a coil spring inserted between the two. This assembly will make a tight holder for the oil can. The location where the holder is going to be put can then be selected and holes drilled in the large iron to fit it to that place.

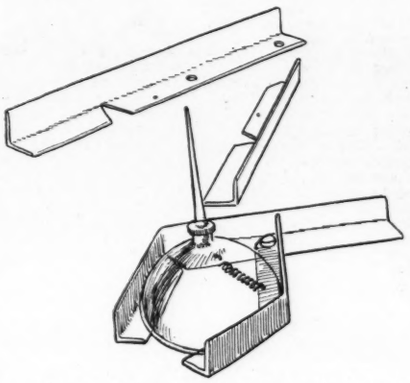


Fig. 1—Oil can holder for attachment under hood which may be made from two pieces of angle iron

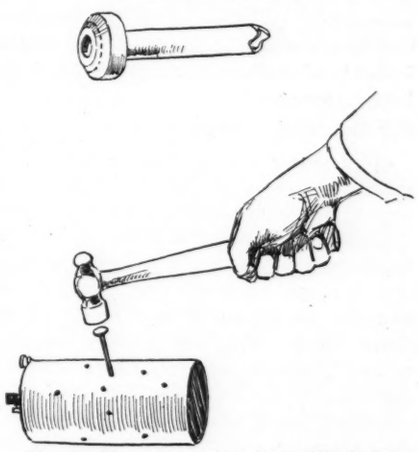


Fig. 2—The upper view is to illustrate method of repairing taper gasoline-line joint which has become jammed. Below is shown method of puncturing dry cell to permit entry of water for temporary recuperation

Stopping Gasoline Leak

In the upper sketch in Fig. 2 is shown a taper seat such as is commonly used in joining gasoline pipes. It is often the case that, because of frequent removal, this brass seat becomes jammed and out of shape so that when the joint is again made it will not seal properly and leakage of the gasoline is the result.

If this ever happens to the reader it is suggested that he scratch a ridge around the taper about where the dotted line shows in the sketch, with some sharp-pointed tool. This ridge should be even all the way around. Now, if the nut is locked against the taper the ridge will form itself to the taper seat, it being of soft brass, and makes a tight joint.

Owners of old cars who are dependent on dry cells for ignition or cranking often find themselves out on a country road with discharged batteries and a stalled machine. Dry cells may be recuperated sufficiently to carry a car a good many miles if they are pounded full of holes with a hammer and a nail and dipped in a bucket of water, or a stream or lake, whatever is most available. The bottom sketch in Fig. 2 shows the method of making the holes.

Curling of Patches

In vulcanizing tires the experience is encountered where the patch curls immediately after being dipped in the gasoline. In cured vulcanizing stock this is unavoidable. The secret of the operation is speed. Thrust the patch quickly through the hole and press down with the fingers on the edge, all the way around, until the gasoline evaporates.

When a casing is vulcanized on the inside and the tube is inserted and inflated, the tube is very liable to stick to the newly repaired portion of the casing. A good relining solution which will avoid this when applied to the repair may be made up from the following formula: 10 pounds talc, 1 gallon liquid cement, 1.4 gallons high-test gasoline or benzol. Of course, this quantity may be reduced in proportion to meet particular needs. Place the gasoline in a container and gradually add the talc, stirring the mixture meanwhile. When the talc is all poured in, continue stirring and add the cement. The finished solution should have about the consistency of good house paint so that it will flow evenly. Apply one coat with a round-headed brush. Powdered graphite may also be used, but is not as permanent as the mixture given above.

In cementing tires for vulcanizing, three coats should be applied. The first, or priming coat, should be thin. This layer must get into the pores to form a foundation for the succeeding coats. The priming coat should be brushed in thoroughly and given 30 minutes to dry. The second coat should be 50 per cent heavier and given the same time to dry. The last coat is another light one and should dry from 3 to 5 hours depending on the humidity of the atmosphere.

Preventing Grease Throwing

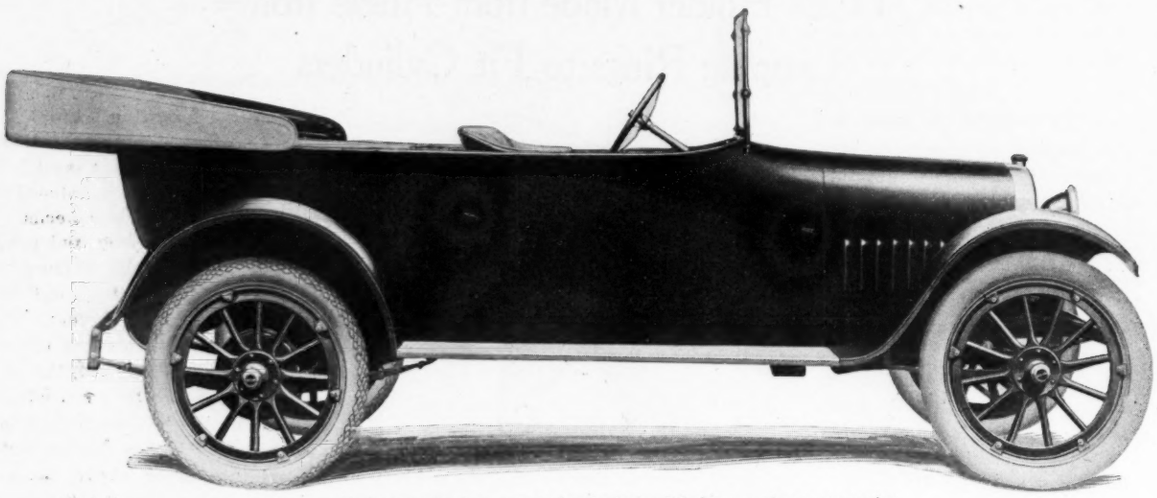
One way to prevent the grease from running out of the ends of Ford rear axles is to drill a $\frac{3}{16}$-inch hole in the bottom of the axle housing on each side. Care must be taken not to drill close enough to the end to injure the bearing. It is after the oil has become thinned through long use that the worst leakage occurs, and at that time it will pass through these holes easily and drop on the ground, instead of running over the wheels and being thrown onto the body. These holes should be high enough so that they will leave sufficient lubrication in the differential housing for the gears.

Motor Age receives many letters from owners who state that they have just fitted their cars with new rings, because the old ones permitted oil leakage into the cylinder heads, and that the new rings do not seem to eliminate the trouble. It may not be sufficient to merely replace these rings. Sometimes, to do a thorough job and one that you know is right the rings should be lapped in.

Worn cylinders are, as a rule, slightly out of round and it is essential, therefore, to fit the ring to the shape of the cylinder by lapping it in. The space at the joint in the ring, providing it is a plain, one-piece job, should be .015 inch. If it is much wider than this, say .025 or .035, there is liable to be a leak.

New Body and Better Springs in Oakland 34

More Power in Overhead-Valve Six



The new Oakland six has a roomier body and better spring suspension

BY the substitution of a new body and a number of detailed mechanical changes the Oakland six for 1917 is a roomier, easier-riding and more powerful vehicle than its predecessor. Owing to the new body, the exterior appearance is changed to a large extent and immediately gives the impression of being a larger car throughout.

It is difficult to compare the present body with that of the 1916 model as the shape has been materially altered. It is 6 inches longer and of this, 5 inches has been taken up by increasing the depth of the tonneau and the other inch in enlarging the front compartment. In addition to the body change, the radiator is entirely new, being made with a deeper shell and a flat instead of a rounded front, so that although a number of indefinable features immediately proclaim the car to be an Oakland, the general appearance is in many respects different. The present model is known as the 34, and it is a refined and enlarged continuation of model 32-B.

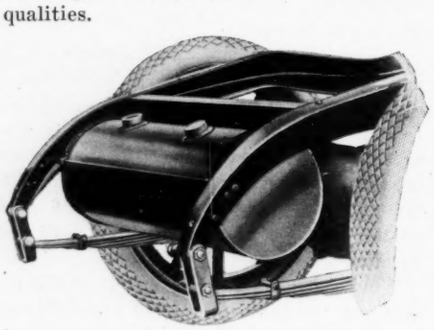
Wheelbase Increased 2 Inches

Although 6 inches has been added to the body, the wheelbase has been increased but 2 inches, from 110 to 112, and the additional body space has been secured by giving 4 inches more overhang in the rear. To take care of the large proportions, 32 by 4 tires are now fitted all around in place of 32 by 3½, although as far as the weight of the car is concerned, the 3½ size is sufficient, thus giving an over-tired car. This should make for tire economy.

Easier riding has been secured through an alteration of the spring suspension. The rear springs are now semi-elliptics in place of the ¾-elliptic and are 51 inches in length, whereas the ¾-elliptic had a length of 40 inches. In changing the spring suspension, the use of Hotchkiss drive has been continued. Another factor in the easy-riding qualities is in the improved upholstery which is now finished in plaited instead of tufted leather besides being better sprung.

Car Has More Power

More power has been given the car by making a series of small changes in the engine, while not altering its dimensions. Actually, an increase of 6 horsepower has been obtained and the principal difference is in a re-arrangement of the valve timing and the use of an offset fulcrum on the valve rocker. This now gives a reduction of 2 to 1, whereas with the former arrangement a 1 to 1 rocker was employed. The practical result of this is that the cams give a longer dwell or open period of the valve, and this taken in conjunction with the new timing gives a higher volumetric efficiency and hence the gain in power. The motor output is now 41 brake horsepower at 2,500 revolutions per minute on the block. The only other change in the engine has been the employment of a Fabroil gear in the timing set. This is a compressed cloth gear of pronounced non-resonant qualities.



The three-quarter elliptic springs of the Oakland model 32-B have been replaced with long, flat semi-elliptics in the new model 34

Structurally, the chassis is the same as it was a year ago, the only change in the running gear being in the wheels. There is a change in the drive, however, which is of a minor nature, and that is the substitution of another make of universal of the four-block type for that previously employed, and a change in the rear axle ratio, making it 4.5 to 1 in place of 4.25 to 1.

A number of improvements have been made in the equipment. The driver's comfort has been considered in the windshield which is now an over-lapping type, so that the rain cannot blow through the juncture point of the two glasses. The top now carries a side curtain and pockets and a little feature which may prove of great value in conserving the car is a connection of the dash lamp with the oiling regulation. By this arrangement the dash lamp acts as a pilot light and burns continuously while the motor is running so long as there is oil in the crankcase. As soon as the supply of oil ceases the lamp goes out.

New Spare-Tire Location

Perhaps the most unique change in the car, since it is contrary to the trend of the past few years, is the placing of the spare-tire carrier in the left front fender. This has been done for the sake of rigidity as it puts a solid supporting platform beneath the tire. It has been moved forward to such an extent that it does not interfere with the left entrance.

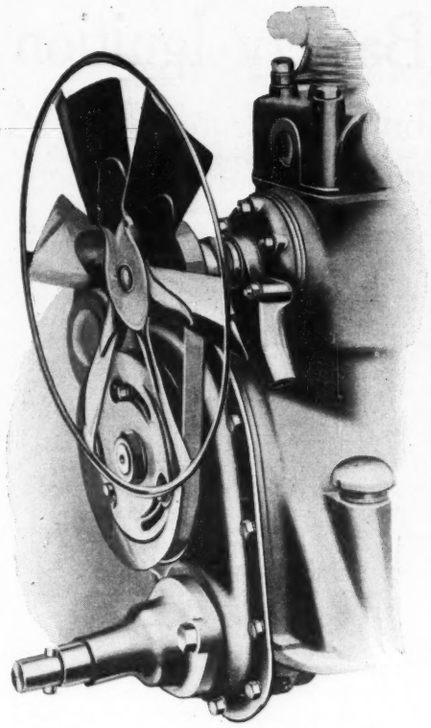
The powerplant is an Oakland-Northway product of the over-head valve, detachable cylinder-head design. It has a bore of $2\frac{13}{16}$ and a stroke of $4\frac{3}{4}$ inches. The six cylinders are cast in a single block and the entire cylinder head carrying the valve action is removable as an unit. In fact, the engine is accessible to a high degree, as the overhead casting permits of reaching the valves and combustion chambers while

the removal of the bottom pan allows the main bearings and connecting rods to be inspected.

Cast-iron pistons are employed and these carry three rings all above the wristpin. The valve mechanism is actuated from a single camshaft with the lifter rods on the exterior at the right side of the engine. These operate the valve rockers directly on a 1 to 2 ratio so that the lift of the cam is doubled. The rockers are assembled on two shafts, each carrying six of them with a support between each two and the rocker. The supports screw into the cylinder head and are easily removable when necessary. For adjusting the valves there is a nut at the top of the push rod at the point of contact with the rocker arm. The valves are 1¼ inch in diameter in the clear and the lift is $\frac{5}{16}$ inch. The valve timing at present has the intake open at 17.5 degrees after upper dead center and close 38 degrees after bottom center, and the exhaust opens 42.5 degrees before lower center and closes 7½ degrees past upper center. This gives a 10-degree lead of the exhaust over the intake opening for the creation of a vacuum in the combustion chamber. Formerly, there was a 5-degree lead and this new timing in conjunction with the longer dwell of the valve opening has been an important factor in securing the six additional horsepower from the same engine.

Front Construction of Motor

One of the features of the engine which is unique is in the front construction which combines the water pump impeller, fan and fan bearing. This makes a unit of the fan and water pump, with the fan belt driving both. The water connection is direct from this point to the radiator with the pump case a part of the cylinder block and also forming the fan support. Particular care has been taken to give an efficient belt with the simple adjustment, so that the layout can be readily taken care of by the average owner and, in fact, requires little or no attention.



The fan and water pump operate on the same shaft in the Oakland six

With the exception of the dash pilot lamp, no change has been made in the oiling system, a circulating splash system being used, operated by a plunger pump driven by an eccentric on the camshaft. This forces oil to a series of splash troughs and the main bearings, which are three in number. A screen is provided through which all the oil must pass before it again reaches the pump, thus insuring a clean supply for circulation.

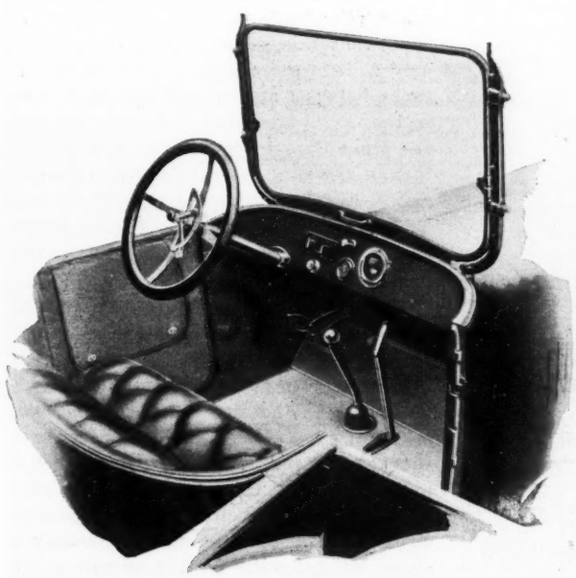
Both the clutch and gearset are in a unit with the Northway engine. The clutch is a cone type with a ball-bearing release and the gearset provides three speeds with reductions in the gearbox of 3.09 to 1 on low, 1.73 to 1 on second, and direct on high. The reverse ratio in the box is 3.98 to 1. These, of course, are multiplied by the 4.5 ratio in the rear axle for final reduction, giving ratios of 13.9, 7.8 and 4.5 on low, second and high, respectively, and 17.9 on reverse.

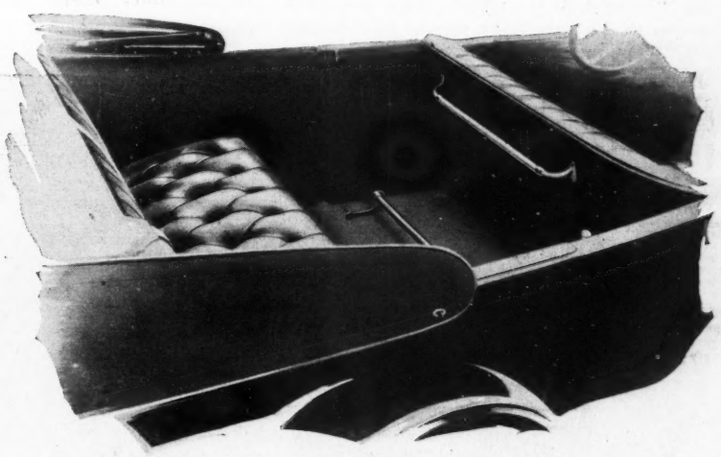
The rear axle is a Weston-Mott. It is a one-bearing floating type with longitudinally split housing. The brakes are external contracting for service and internal expanding on the hand lever. As was the practice in the previous model the brake links are carried back to the rear transverse member, at which point they are broken with a short link to the rear. Adjustments are made by means of turnbuckles which are fitted to the rods in front of the rear transverse member.

The steering gear is a Jacox irreversible type with a 17-inch wheel. The control members are notably accessible with a ball-type shifting gear within easy reach of the driver. The floor is tilted beneath the cowl and the pedals project in such a way as to provide plenty of floor room for the driver, as well as the passenger in the front compartment.

Fittings Are Complete

In the way of fittings, the car is complete. The tires are non-skid in the rear, and all the necessary instruments including speedometer, ammeter, gasoline gauge, switches, etc., are included at the list price. The top is a one-person design or it may be a close convertible at an extra price. The storage battery is an Exide. The speedometer is a Stewart and the car is provided with a full set of lamps, license plate bracket, electric horn and tools. The trimming is in genuine leather, with coach green for the body and wheels, with black for the fenders as standard. The prices are $845 for the five-passenger touring and two-passenger roadster, or $1,095 for the closed-convertible sedan model, and $1,085 for the closed-convertible coupe. A year ago the car sold for $795 and the $50 difference in price is made up in the more expensive tires, bigger bodies, and generally better equipment of the new models. Winter bodies are new this year.





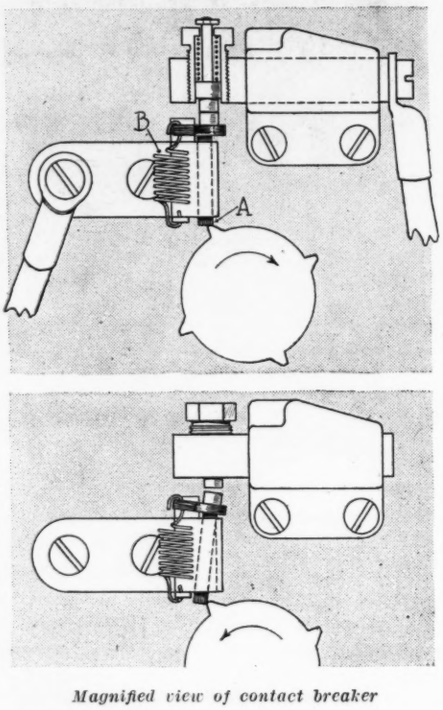
Above—The rear compartment of the new Oakland six is much roomier than in the previous model. Left—Control arrangement in Oakland 34. The front compartment is longer than previously

Duplex Battery Ignition System

New Philbrin Distributer Gives Alternative Forms of Spark Production

PRODUCED by a man who has been in the battery ignition business for a good many years, the Philbrin duplex battery ignition has many unique points. It is made by the Philips-Brinton Co., Kennett Square, Pa., which is just ready to supply in quantities. As its name implies it is a system including two alternative methods of producing the spark, and either of these methods can be used with storage battery or dry cells. The two methods of spark production are called, by the makers, the main system and the secondary system, and as they operate on quite different principles they can best be considered separately.

The distinctive feature of the main system is the constructive detail of the contact breaker. This is small, very strong, gives a square contact between the points and a very quick break which is claimed to have less lag than any other type. In the sketch shown the principal parts of the contact breaker are outlined on a magnified scale. The upper contact is set in an adjustable socket backed by a strong coil spring. The lower contact is secured to the end of a hardened steel trigger A which can be lifted from beneath by the cam point. To follow the action imagine the cam rotating clockwise. The point of the cam will catch the foot of the trigger and lift it till the points are in contact. The spring above the upper point determines the firmness of the contact obtained.

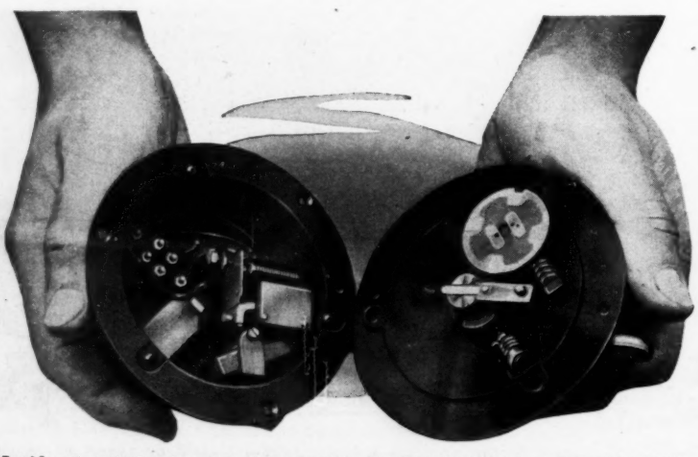


Magnified view of contact breaker

Lag Almost Eliminated

As soon as the tip of the cam reaches the edge of the trigger, all support is removed and the small coil spring B causes the trigger to fly back with practically no lag whatever in the speed. This quickness is due to the very light weight of the trigger and to the rapidity of action obtainable from a coil spring.

Now, it is easy to make a rapid action cam with a square drop like this, but precaution has to be taken to prevent the trigger from being broken off should the engine reverse its proper direction of rotation. To guard against this possibility of damage, the trigger slides in a groove as seen in the sketch, but this groove is open behind the trigger which is held in its working position by the spring. Thus, if the direction of rotation is reversed, the trigger merely moves back out of the way as if it were hinged at the top.



Inside of switch, showing the vibrator employed for the secondary ignition, which reverses the direction of the current with each kick of the ratchet

The cam points are so designed that they give a duration of contact equivalent to 3½ degrees of movement which is sufficient to permit the current to saturate the condenser at speeds of the cam sufficient to fire a 12-cylinder engine at 5,000 revolutions per minute. There is only one adjustment, this being the closeness of the contact points which should be about 25-30/1000 inch apart when broken. When the points wear down the need for adjustment will become apparent through the engine refusing to run at maximum speed; when this is noticed a fraction of a turn of the nut back of the upper contact will restore the original speed range.

The condenser for the main ignition is contained within the breaker box, and the coil is either combined with the distributer unit or is separate. The switch selects either storage battery or dry cells.

For spark advance the Philbrin has no automatic mechanism this being said to be needless because of the absence of lag in the breaker. A lever is provided for hand advance and is made in two forms; one moves the whole distributer and another moves the cam without affecting the external parts.

Distributer of Secondary System

In connection with this "main" system there is a distributer which is also part of the secondary system. It is mounted above the breaker box and is of the non-contracting type, where the high tension spark leaps a small air gap. Inside the distributer head are a number of brass studs corresponding to the number of cylinders, and above the breaker cam there is a Bakelite disk carrying a brass sector which conveys the high tension discharge to each of the spark plug leads in turn. It will be noticed that this sector is very long, being only a little shorter than the circular distance between any two of the fixed studs in the distributer head, this meaning that the front edge of the sector is within $\frac{7}{32}$ inch of the stud ahead of it while its hind end is still level with the edge of the stud behind. The reason for this great length of sector is made plain by the description of the secondary system.

The secondary system uses no part of the breaker mechanism. Within the switch assembly that attaches to the cowl board, is a special form of vibrator, consuming little current and operating at a vibratory speed of from four to five times that of the old-fashioned coil vibrator. There is a very peculiar thing in connection with this vibrator, this being that it requires no adjustment, in fact the manufacturers disclaim all guarantee if the adjustment is

altered within the lift of the contact points. The latter are large, and will wear a very long time, and it is stated that the action is not affected in any way by such wear as can occur up to the very last limit.

Looking at the outside of the switch box it will be seen that there are two controls. The lever gives the "off" when in the middle position and can be turned right and left to pick up the storage battery or the dry cells. Above it and to the left is a knob moving on a ratchet. This gives a series of positions marked H and S meaning main and secondary ignition. When the pointer is opposite any of the H marks the breaker is working and the engine being fired on the single spark system, but when the pointer shows an S, it means that the contact breaker is cut out altogether and a continuous current is flowing through the vibrator all the time the switch is on.

The vibrator is in circuit with the primary of the coil, so a steady stream of sparks is being sent to the distributer, and this is the reason for the long distributer sector. As the distributer turns it will continue to supply sparks to any one of the plugs during the whole time the sector takes to pass the stud in the distributer head. As the piston descends on the firing stroke the resistance at the spark plug points drops, so when the front end of the sector is approaching the next stud, there is no risk of a long thin spark jumping out ahead of the sector, the next spark plug will not get a spark at all till the sector is close enough to insure a good fat discharge.

Effective Ignition

Naturally such a sort of ignition is very effective, particularly if the carbureter is not working well or if the engine is very cold, and it is also claimed that the continuous spark prevents oil from collecting on the plug points. The discharge is said not to injure the points because its intensity is never great enough to do them any harm, increased speed has no effect on the nature of the spark; there is no flame produced. As to the current consumed this is about one ampere, or similar in amount to that taken by a cowl board lamp bulb, much less than that consumed by a headlamp of ordinary size and power.

It will be seen in the view of the switch cover that there are a series of H and S positions controlled by the ratchet knob. Their purpose is to reverse the direction of the current flow at each click of the ratchet and so equalize the wear on the contact points of both main and secondary systems.

ORIGINAL TANK INVENTOR

Bloomington, Ill., Oct. 21—The caterpillar motor that is creating such a stir in the war world, was invented 25 years ago by Bijah Taylor, an eccentric character of Mason City, Ill. He conceived the idea, but his models failed to attract capital and he died in poverty. The truck invented by Taylor was operated by a steam turbine, invented by himself. The model carried its own track, very much like the successful machines of today. Taylor's dream soon faded. He believed that his invention would revolutionize railway transportation, doing away with ties and tracks. The engine was planned to operate upon city and country roads, pulling a train of wagons. Taylor simply was ahead of the times, anticipating the needs of the public by 20 years.

Switch cover of Philbrin mechanism as it appears on the cowlboard

CAR EXPORTS SHOW GAIN

Washington, D. C., Oct. 21—Figures made public by the Department of Commerce show that 6,819 cars, valued at $8,016,643, were exported in August last, as against 5,453 cars, valued at $7,509,027, shipped abroad during the same month of last year. The August exports this year were divided as follows: Commercial cars, 1,565, valued at $4,442,158; passenger cars, 5,254, valued at $3,574,485; parts, not including engines and tires, $2,051,895. During August of last year there were 1,614 commercial cars, valued at $4,387,193; and 3,839 passenger cars, valued at $3,121,834, exported, together with parts, not including engines and tires, to the value of $2,038,321.

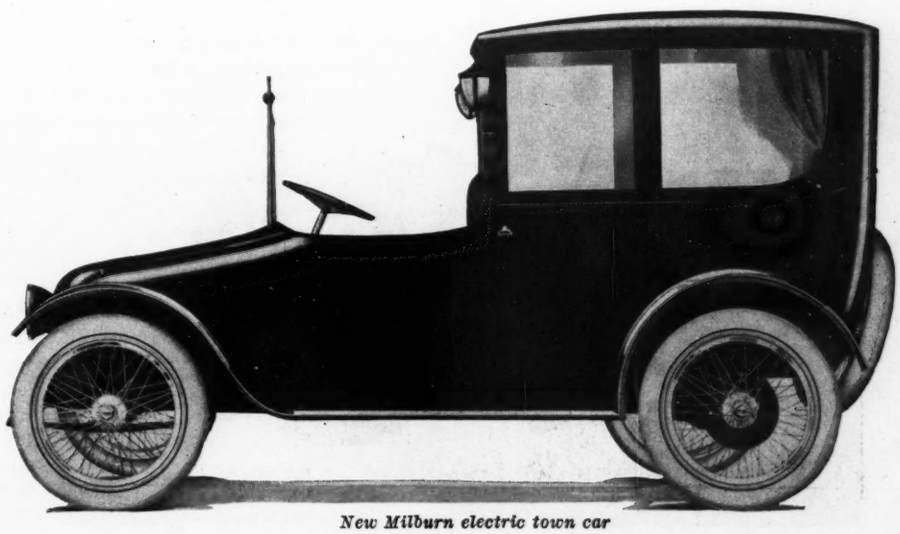
The big feature of the exports for the 8 months ended August, 1916, was the number of passenger cars exported, the number being 43,661, valued at $29,472,228, as against 26,736 cars, valued at $23,576,188, exported during the corresponding period of 1915. On the other hand, the exports of commercial cars dropped from 15,042, valued at $41,886,961, during the 8 months of 1915 to 12,938 cars, valued at $35,167,840, during the same period of this year. Exports of parts, not including engines and tires, increased from $9,381,440 during the 8 months of last year, to $15,227,161 during the same period of this year.

CASING HEAD GAS PRODUCTION

Corsicanna, Tex., Oct. 20—It is conservatively estimated by men who are interested in extracting gasoline from natural gas that the total yield from this source for 1916 will be considerably in excess of 100,000,000 gallons, as compared with about 65,000,000 gallons for last year. Although Oklahoma leads in this industry, big strides are being made in Texas and Louisiana in building the plants for taking gasoline from natural gas. It is stated that the natural gas resources of Texas, in their present stage of development, are capable of yielding many times the total production of casing-head gasoline of the whole country at this time. In both Oklahoma and Texas the gasoline content of natural gas of most of the fields runs high, the average being a little more than 3½ gallons of gasoline from every 1,000 feet of natural gas.

NEW MILBURN TOWN CAR

Toledo, Oct. 20—A town car is the latest electrical vehicle to be introduced by the Milburn Wagon Co. It is designed with the same principle of reducing weight as is evident in the coupe models put out by this manufacturer. The price is $1,995.



New Milburn electric town car

Allen Announces Winter Bodies

Convertible Sedan Sells for $1,095 and Three Passenger Coupe for $1,075

A COUPE at $1,075 and a convertible sedan at $1,095 are the winter offerings of the Allen Motor Co., Fostoria, O. Both bodies are fitted to the 112-inch wheelbase chassis.

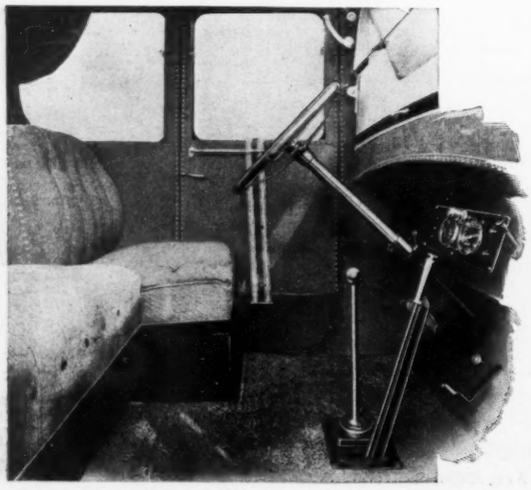
The coupe is a completely furnished three-passenger enclosed car. The seats are roomy and are upholstered in heavy all-wool grey whipcord. Interior trimming is of grey broadlace with silk curtains. The interior is lighted by a center dome light. Body panels and hood are finished in dark blue, while the top, above the bead, radiator and fenders are black. The wheels are light cream.

While this coupe is primarily a closed car it is the work of but a moment to lower the side windows out of sight. The ventilating windshield is topped with a rain visor which insures a clear vision in stormy weather.

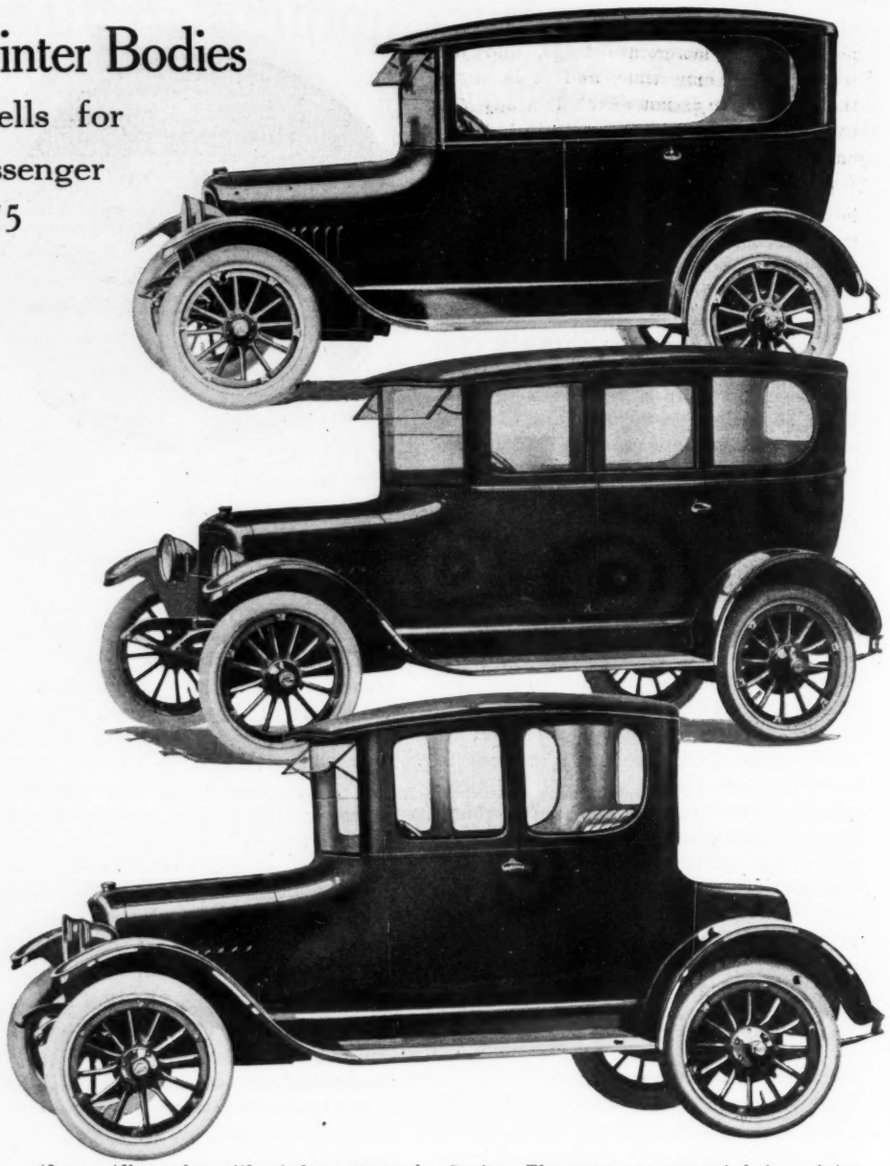
Sedan Convertible Type

The sedan is the convertible type having a permanent roof. The interior trimming and illumination are the same as the coupe. All side windows lower out of sight, and the door pillars are removable, being readily detached by loosening thumb screws. The pillars are carried in a small compartment in the back of the rear seat when not in use. There is a space of 6 inches between the rear seat and the back of the top which affords women occupants an opportunity to lean back comfortably in the seat without crushing their hats, a feature which is readily appreciated.

The sedan seats five and the front seats are divided into a roomy passageway. The cushions are covered with grey Spanish imperial upholstery. In finish the sedan is similar to the coupe. Wood wheels are standard equipment.



Seating arrangement in Allen coupe



Above—Allen sedan with windows removed. Center—The same car converted for winter use. Below—Coupe

Changes in M. and A. M. Personnel

New York, Oct. 21—F. Hallett Lovell, Jr., president and a member of the board of directors, and William M. Sweet, manager of the Motor and Accessory Manufacturers have resigned from the organization.

Mr. Lovell's retirement was due to his giving up active business, whereas Mr. Sweet is retiring to assume the duties of assistant to president of the United United Motors Corp.

C. W. Stiger, Stromberg Motor Devices Co., was elected to fill Mr. Lovell's unexpired term as president, while Mr. Sweet was elected a member of the board of directors to succeed Mr. Lovell and will serve until 1919. Mr. Sweet was also elected chairman of the 1917 banquet committee.

Christian Girl, of the Perfection Spring Co., was elected a member of the executive and finance committees. William Rands, of the Motor Products Corp., was elected as a member of the board to succeed C. E. Whitney, resigned.

SPRING MAKER DIES

Racine, Wis., Oct. 20—Michael Higgins, founder and president of the Higgins Spring & Axle Co., Racine, Wis., died from an affection of the throat, just as he was preparing to leave for California for the winter's stay to seek relief. He was 61 years old and a native of New York. He learned the spring business in Bridgeport, Conn., and in 1885 founded the Racine company. Mr. Higgins served as mayor of Racine for 8 years.

WEAVER AGAIN WITH TIMKEN

Detroit, Mich., Oct. 21—R. B. Weaver has returned to Timken Axle Co. as chief engineer, succeeding J. G. Perrin, who resigned because of poor health.

Commerce Introduces a One-Tonner

Electrically Equipped—Chassis Price $1,175

IN addition to the 1,500-pound wagon, the Commerce Motor Car Co., Detroit, is now marketing a 1-ton truck. This is the first departure of this concern which has been manufacturing vehicles for 7 years, from a single model policy and marks its entrance into a new field of light commercial car work.

Following the customary practice in light-capacity trucks the Commerce 1-ton model E, is sold as a chassis completely equipped with electric starting and lighting, and a governor. The list price is $1,175 for the chassis alone and to this may be fitted a wide range of body styles. As standard the Commerce company is marketing an open body at $60 and a body with a four-post top and storm curtains at $100. Deliveries on this vehicle will start on November 15.

Commerce 1-ton truck with electrical equipment. The practice in the design has been to eliminate all unnecessary parts

As far as the power plant is concerned this truck is the same as the 1,500 wagon with the Continental unit having a block of four cylinders with 3½ bore and 5-inch stroke. This is an L-head design of medium duty characteristics and carries the clutch and gearset as a unit plant. Conventional design is used throughout and a good index to the construction of the engine is given in the main bearing dimensions which are: Front, $2\frac{3}{16}$ by $2\frac{7}{8}$; center, $2\frac{7}{32}$ by 2½ and rear, 2¼ by 3. This gives a minimum crankshaft diameter at the bearings of 2½ by 2¼ inches.

Powerplant Simplicity

Following the dictates of common-sense in truck motor practice everything about the powerplant is as simple as it is possible to make. The oiling system, for instance, is a simple splash in which a constant level is maintained by a plunger pump. The only attention that the oiling system requires is to keep it filled with oil to the proper level, and occasionally to flush the crankcase with kerosene. The capacity of the reservoir which is in the lower part of the crankcase is 1-gallon.

The ignition system is also a fool-proof installation being a single high-tension Eisemann magneto with even the spark lever removed, as the timing of the ignition is fixed. Cooling is by thermo-syphon in connection with a vertical-finned tube radiator with a removable cast top. The radiator construction is quite interesting, being an up-to-date adaptation of the cast-tank and side-member design.

Commerce vertical-finned tube radiator, with removable cast top

In the bolted-on bell housing are a leather-faced cone clutch and a three-speed selective gearset. From these the drive is transmitted through a propeller shaft and universal joint set manufactured by the Arvac Mfg. Co. The joints are made of drop forgings with felt washers and circular wire springs for retaining the grease. The shaft is hollow, having an outside diameter of 1¾ inch and a wall thickness of $\frac{3}{16}$ inch. From the rear universal the drive is transmitted to a Torbenson internal gear rear drive carried on roller bearings of Bower and Bock manufacture.

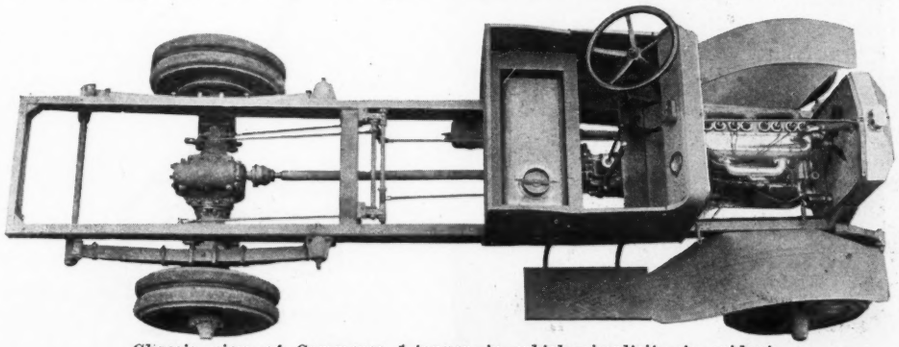
The regular tire equipment is solid rubber of 34 by 3 inches in front and 34 by 4 inches in the rear. When pneumatic tires are fitted at an extra cost the tire sizes are 34 by 4½, front, and 35 by 5, rear.

The frame is a high-carbon steel product of channel section.

Double Set of Brakes

A double set of concentric brakes is used on the rear wheels. The internal is 15½ by 2¼ and the external 16 by 2½ inches. These are connected with the brake control mechanism by direct-line linkage and are secured against rattles. The spring eyes and shackles are also secured against wear and looseness by using bronze bushings at all points and protecting these by oil cups.

In the way of fittings and equipment the car is unusually complete for a commercial vehicle. The Remy electric equipment is used for starting and lighting in connection with a Willard storage battery. The carbureter is a Zenith which is also in line with the simplicity of the entire chassis as there are no adjustment points beyond those fixed at the factory. For gasoline feed the Stewart vacuum system is used, operating in connection with a 15-gallon welded steel tank located beneath the driver's seat. The lamp equipment consists of side and tail running lights with a powerful searchlight for picking up house numbers, street signs, etc. The standard bodies have a leading space of 44 by 110 inches.



Chassis view of Commerce 1-tonner in which simplicity is evident throughout

The Accessory Corner

Superior Spot Lamp

COMBINING the functions of a spot and trouble lamp, this lamp can be moved in any direction desired and throws a direct beam of light far in advance of the car. It has a silver-plated, spun-brass reflector and the exterior is finished in dark enamel which the manufacturer states will not peel. The lamp is fitted with an adjustable, removable mirror at the back of the clamp so that the driver can see cars coming up behind. The lamp itself is a 6-volt, 21-candlepower nitrogen type with double contact, the switch being on the end of the handle. The windshield attachment is of heavy steel with strong bolts to prevent the lamp from sliding. The lamp is 6¼ inches in diameter over all and the length from the switch to the lens is 7⅞ inches. A cord 10 feet in length is supplied with each lamp for use as a trouble detector. Pittsburgh Lamp, Brass and Glass Co., Pittsburgh, Pa.

Gasoline Filler for Fords

With the fillometer in place, the gasoline tank of the Ford can be conveniently filled without either of the occupants of the front seat getting up. The nozzle of the device is large enough to take gas from any garage filling station. It is so constructed as to screw over the filler cap on the Ford gasoline tank, and to fit snugly under the seat cushion with its nozzle projecting past the edge of the seat in such a position as to be out of the way of the occupants of the car. The new device is a product of the Apex Electric Mfg. Co., 1410 W. 59th St., Chicago. The same concern makes the Yankee tire pump, which is also illustrated on these pages. This pump clamps on to the running board of any make of car and operates with a lever handle. The Yankee pump sells for $5.

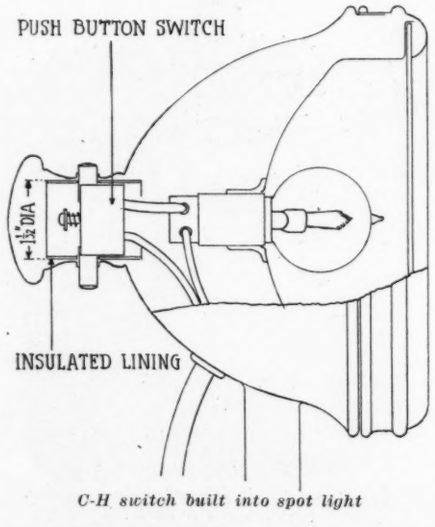
Spark Plug Intensifier

The Marvel spark plug intensifier is based on the principle that electrical current, when made to leap a gap, must gather force to make the leap and, therefore, progresses with increased energy. It has a glass barrel in which is contained two sparking points set with the proper gap. Of course, it is possible to see the spark jump at all times, and this is valuable as a check on the ignition system. It is claimed that with the increased spark the plug will fire though it is covered with soot, carbon or grease. The intensifier retails at $.75 each, or $3 per set of four. It is a product of the Marvel Mfg. Co., 1020 Washington Blvd., Oak Park, Ill.

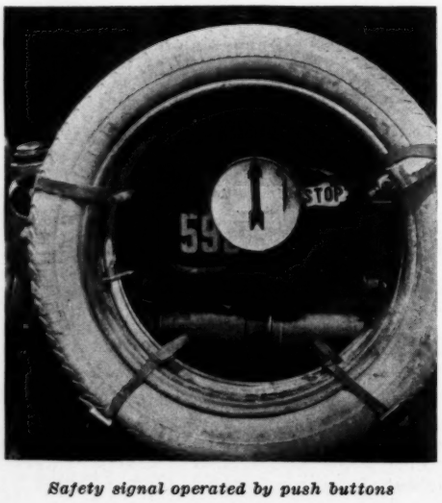
Spring Cushion Tire

The DeVoll spring cushion tire is composed of a series of Swedish-steel springs made to fit inside of any outer casing, new or old. The springs actuate on roller bearings on the surface nearest the rim and bend from these bearings around the casing to support a core in the top center on which the cushion travels, as is shown in the illustration. With the use of the roller bearings, the cushion springs do not come in contact with the casing. The function of the roller bearing is to permit the tire to take the side thrust. Each spring is a unit free in its action and at the same time firmly locked in a housing. A core on which the outer casing rests holds the casing to a narrow thread where it is thickest. At present the following sizes are carried in stock for Fords, Maxwells and Briscoes; 30 by 3, per set of four, $125; 30 by 3½, per set of four, $125; 34 by 4, prices on application. Other sizes will be added by the American Spring Tire Co., 30 W. Lake St., Chicago, which markets the device.

Spring cushion tire which fits in any casing



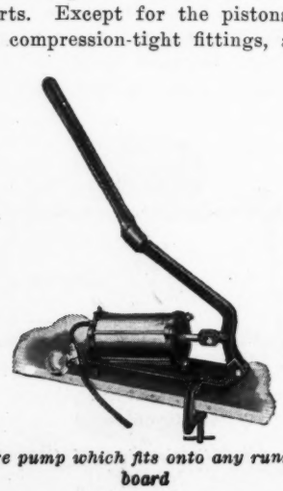
C-H switch built into spot light



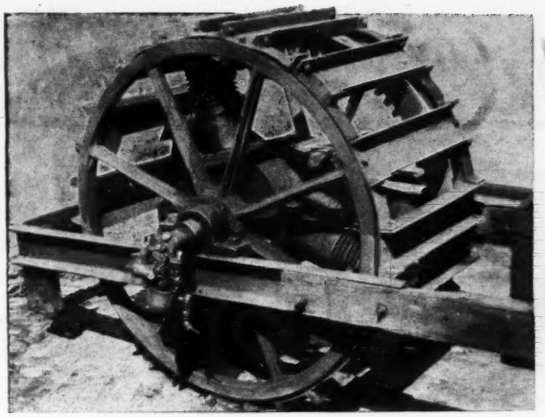
Safety signal operated by push buttons

Tractor Wheel With Rotary Motor

The vest-pocket farm tool is driven by a three-cylinder, air-cooled gasoline engine which revolves around a main axle. It is about 3 feet in height and 24 inches wide. All of the mechanism with the exception of the carbureter is located within the single wheel or framework. This large wheel consists of two iron-spoke wheels connected by channel irons which serve as tires and provide traction. The axle is stationary and serves as a crankshaft. The motor has a stroke of 4 inches and a bore of 3¼ inches, and when revolving at a speed of between 300 and 400 revolutions per minute, it is said to develop between 9 and 12 horsepower. It has three impulses to the revolution through an ingenious system by which each cylinder, as it is firing charges the adjacent cylinder through a conduit. The amount of charge is controlled by a cutoff, which in turn is governed by a connecting rod. In each cylinder of this engine there are but three moving parts. Except for the pistons, there are no compression-tight fittings, and the



Tire pump which fits onto any running board



Tractor wheel driven by rotary motor

Adjustable carrier for attachment to rear of Ford frame

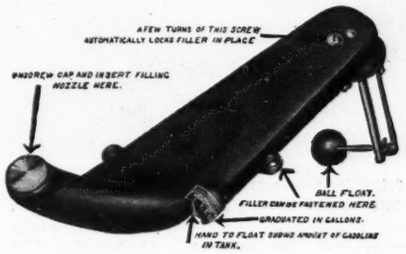
motor has no crankcase compression. The frame of this tractor is carried by the wheel by means of an axle, which passes through the hubs, one of which is attached to either side of its frame. The axle is hollow at either end. On the left side the carbureter is located, this being equipped with an 8-foot intake pipe, which carries the intake safely away from the dust caused by plowing. The gas charged passes from the carbureter, through the hollow axle to the cylinders. On the right side of the frame are provided means for the control of the clutch, gearset and timer. The tractor is the invention of P. O. Fredlund, Pasadena, Cal.

Trailers for Every Use

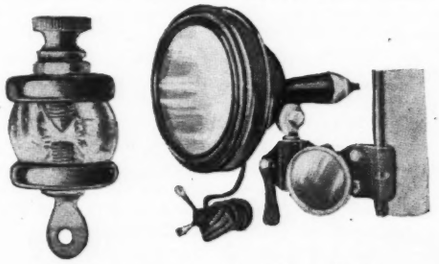
In the light four-wheeled trailer made by William G. Hesse & Son Co., Leavenworth, Kans., both the front and rear axles are utilized to facilitate short turning, and at the same time make the four wheels track with the rear wheels of the car which is pulling the trailer. The operation is handled very simply by running cross bars from each front wheel to the rear wheel on the opposite side. Trailers embodying this feature may be had with solid or pneumatic tires of varying capacities and with express bodies, canopy tops, or special bodies for commercial work. The same company also makes two-wheeled trailers with solid and pneumatic tires, and trailers of a capacity of ¾-, 1-ton, 1½-ton and 3-ton. Of course, the heavier models are designed for use behind motor trucks or hauling tractors.

Lexington Safety Signal

Two circular 8-inch casings containing indicator dials and the necessary mechanism, are the salient points in this signal. One of these casings is mounted at the front and one at the rear of the car, the front one having a small window for the observation of the driver, showing the working of the indicator and lamps. A black arrow on the white background of the casing points the direction the driver intends to take, and at night or in bad weather the arrow signal works in connection with the lights. There is a Stop signal in the rear attached to the casing, consisting of a white hand with the word Stop in white letters. When working it is thrown into a horizontal position with a red light directly over the word Stop. A 3½-inch, three-way switch in a brass casing is clamped to the steering column under the wheel and operates the signals by four push buttons. The top button works the arrows to the right or left and also the lights when the current is on. Another push button on the top throws the current for the lights off and on, while the push button underneath works the stop signal. Another button on the end works the horn. The main feed wire is run to each indicator and to the switch on the steering column and then to the battery; return wires being properly connected. All wiring is run through conduits, preventing interference in any way with other parts of the car.—Lexington Signal Co., Lexington, Ky.



Gasoline filler for Fords which permits passengers to remain seated



Left—Spark plug intensifier. Right—Combination spot and trouble lamp

Trailer in which all wheels are utilized for turning

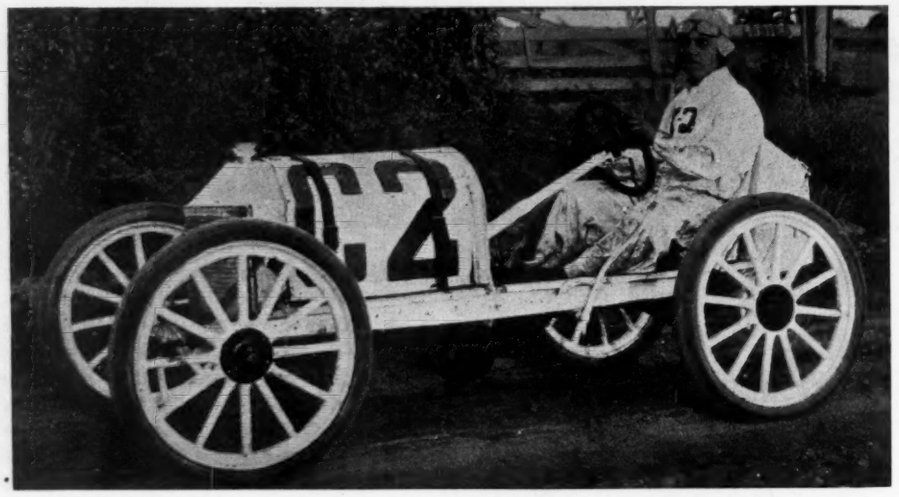
Adjustable Carrier for Fords

The National adjustable carrier is fastened to the rear of a Ford frame and when closed leaves a compact tool box fitted snugly against the rear of the Ford body, and when open, creates a loading platform large enough to carry five or six milk cans, camping equipment, small farm tools, farm produce, trunks, etc. The carrier sells for $27.50 with everything furnished, such as an extra leaf for the rear spring should the purchaser desire to carry extra-heavy loads, nuts, bolts, lamp brackets, and so forth. It is marketed by the National Mfg. Co., Denver, Colo.

Push Switch Control

A Chicago manufacturer of spotlights has introduced a particularly interesting method of controlling the current to his lamp. This Chicago manufacturer has adopted a small C-H push switch similar to that which has been used in tool handles, as well as the handles of electric vibrators, vacuum cleaners, etc. This method of operation makes it easy for the same hand that moves the lamp in the various directions to control the current of the lamp by simply pushing the button. When the light button is pushed the current is on, and when the dark button is pushed the current is off. The switch, sometimes called a tool-handle switch, and made by the Cutler-Hammer Mfg. Co., of Milwaukee, is placed inside the small neck of the lamp similar to method shown on the sketch. A fibre insulating sleeve protects and separates it from the metal parts of the lamp. The push buttons are put in place in the switch after the switch is slid into the small neck of the lamp.

From the Four Winds



A MINIATURE RACER—This is a view of the smallest and as fast, if not the fastest, racing car for half-mile track in the state, according to its owner, H. J. Leach, Mt. Carmel, Ill. It won the southern Indiana and southern Illinois state championship in a 100-mile race at Vincennes, Ind., last summer. It defeated the car that won the Illinois state championship at Chicago, in two straight 10-mile heats at Charleston, Ill., this season. It has earned for its owner this season more than three times its cost. It has a wheelbase of 72 inches and a tread of 45 inches and weighs 900 pounds.

PHILADELPHIA May Require Car Locks—Car thefts in Philadelphia have increased so much the police department of that city is considering an ordinance that will make it illegal to leave cars on the street unguarded without a safety device or lock of some kind.

Check Tourists on Mohawk Trail—Some evidence of the great number of tourists this fall, especially in the East, was shown by the count taken last Sunday of cars going over the Mohawk trail. More than 2,500 cars made the trip, carrying a total of about 10,000 people over the famous highway from daylight to dark. This is a record for 1 day on the trail.

Citizens Object to One-Way Traffic—East Hartford, Conn., where many of those employed in Hartford, just across the Connecticut river, sleep, is again in the limelight through the activity of its officials in declaring Main street a one-way thoroughfare. Main street on the west side is paved with tarvia and is a good road. The east side of the street is nothing more or less than a dirt road. Motorists brought into court have asserted the town has no right to declare the west side of the street a one-way thoroughfare, as the road was built by the state and is really a part of the trunk system. Many arrests have been made for the alleged cutting of corners. Some car owners in Hartford who have been driving cars for years and have never up to recently figured in court have been fined.

St. Louis Would Curb Thefts—The police department of St. Louis, Mo., is urging the passage of an ordinance which it believes will check car thefts, if not stop them. The ordinance provides that all buyers of junk and second-hand car parts and tires must hold such purchases for 30 days in a place open for inspection.

Octogenarian Makes 800-Mile Trip—Mr. and Mrs. Allen B. Jones, Flint, Mich., 84 and 62 years old, respectively, have completed an 800-mile jaunt through the East, with Mr. Jones at the wheel. The trip included a visit to Alabama Center, N. Y., the boyhood home of Mr. Jones. It was made in a Chandler six which Mr. Jones has driven more than 2,000 miles since he bought it in June.

Rural Cars Exceed Cities'—Statistical data relative to ownership of motor cars in counties where the major part of population is in large cities, and in counties where the population is almost exclusively agricultural, indicates, according to the Good Roads Association of Wisconsin, that the farmers today are the owners of cars in a much larger proportion than the city men. In statistics furnished by four counties in which the larger cities are located, one person in thirty-two is shown to be the owner of a car, while figures covering six agricultural counties indicate one out of every sixteen persons owns a car.

Town Disappears; Cars Responsible?—Once a prosperous community the town of Molan, S. D., has given up to the motor car. Because farmers who owned cars preferred to drive farther to large centers to trade, stores have gradually disappeared and the last general store closed last week.

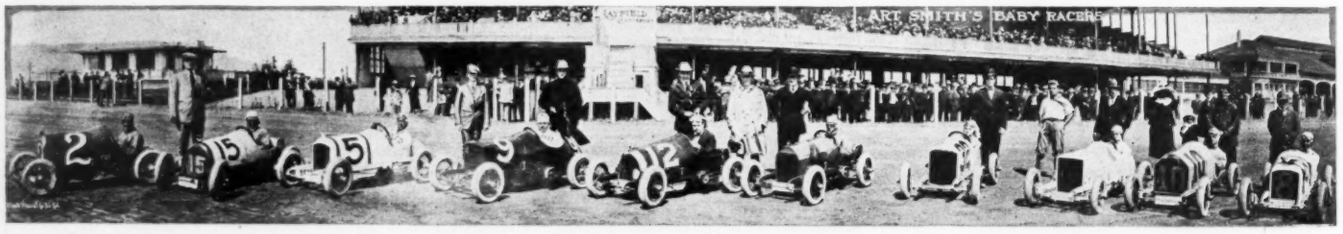
Twin City Car Thefts Heavy—In the first 9 months of the year 685 cars were stolen in Minneapolis, with fifty still missing. Forty-five men have been convicted and four are awaiting trial. Nearly 100 cars are in the city stolen from Chicago. For 8 months, in St. Paul, the police report 609 cars stolen and 606 recovered.

A Beauty Show for Cars—Beauty shows for babies are not unusual, but when the car enters one, it is unusual. Nevertheless, more than twenty makes of cars were entered in that held at the Delaware county fair in Ohio recently. The cars were driven slowly along the race course and were judged for appearance, beauty of body design and finish. The Allen won this particular beauty show.

"Minn." Means Minnesota; Not Minneapolis—Because St. Paul, Minn., believed that the abbreviation "Minn." at the end of the state license tags gave the impression that all cars thus marked are from Minneapolis it has been the custom of spelling out Minnesota. The attorney general's department has ruled that "Minn." must be restored under the motor vehicle law and so will appear on the 1917-1919 issue.

Journeys Cross Country on Crude Oil—Mr. and Mrs. Leo A. Calhoun, Salt Lake City, are following the Lincoln highway on their way to New York by the motor power furnished by distillate, a crude oil costing 10 cents a gallon. Mr. Calhoun reported at Omaha that 1 gallon lasted 19 miles on the desert roads east of Salt Lake City, as against the usual 10 for gasoline. An attachment between the carbureter and the engine makes the use of oil possible.

Organize for Social Welfare—Office and shop executives of the Falls Motors Corp., Sheboygan Falls, Wis., have organized an association for the promotion of business and industrial efficiency and social welfare. Officers have been elected as follows: President, F. M. Lindsay; vice-president, W. J. Corr; secretary and treasurer, Fred Hauenstein; executive committee, F. A. Harrison, J. B. Eck, F. A. Mulrine and D. McKenzie. Honorary membership was accepted by Presi-



JUNIOR RACES AT FRISCO—A novel and most interesting series of races was held at San Francisco recently in which ten miniature racing cars competed for supremacy. The cars used were built by using motorcycle engines fitted to special small-sized racing car bodies. All the cars were equipped with 20 by 4 Goodyear aeroplane tires, on miniature wire wheels. A speed of 65 to 70 miles an hour was attained with these small racing cars, and the races were fully as exciting as those in which high-powered racing cars break world's speed records. Plans are being made to bring these cars East next year.

dent Gustave Huette; Vice-President R. W. Randall and Secretary-Treasurer Angelo R. Clas.

Ohio Association's Legislative Campaign—The Ohio State Automobile Association, through its legislative committee, has formulated a program for legislation to be urged before the coming session of the Ohio General Assembly, the main points of which are: compelling all vehicles to carry lights after dark on all public highways; to restore the half-mill levy for the building and maintenance of roads and to increase the maximum speed on country roads from 20 miles to 30 miles per hour.

San Francisco to Have Motor Bus Line—San Francisco plans to be a pioneer in the municipal operation of motor bus lines for street traffic, and before the year is out expects to be running them in connection with the municipal railways. The first will be across Golden Gate park. Transfers will be issued and accepted with the municipal line. The city engineer reports five busses can be operated at 13 cents a mile and will pay because of the increased traffic they will bring to the municipal lines.

Connecticut Registration Receipts Increase—Receipts for the present fiscal year from the registration of motor cars, motorcycles, trucks and individual drivers in Connecticut total $768,727.91, as against $536,970.09 for the corresponding period a year ago, an increase of approximately 33 per cent. It is expected that the annual business will be $1,000,000. This is to be turned over to the highway department for the repair of state roads some of which need treatment very badly. There were 59,641 car registrations and 71,980 operators' licenses issued during the fiscal year.

With the Motor Clubs

Club for Walla Walla—A motor club is to be organized in Walla Walla, Wash., within a short time, according to plans of motorists who have become interested in the movement through the work of the Motor Vehicle Protective Association. This association has appointed C. F. Webster district agent for southeastern Washington and northeastern Oregon and he will direct its activities, with Walla Walla as a headquarters.

Missouri Organizes State Club—A temporary organization, which will, in all probability, be known later as the Missouri State Automobile Club, was formed in Sedalia, Mo., September 30 by members of clubs throughout the state. C. C. Kelly was elected president of the temporary organization, and S. E. Spencer was elected secretary. Both men are members of the Sedalia Automobile Club. The work of organizing the entire state will be placed in the hands of vice presidents who will be appointed for each congressional district in the state.

Club Turns Speed Fine Tables—For some time complaints had been turned in that Constable Thompson of Haverford township, Pa., was imposing fines of $10 and $25 for alleged violations of the law. Many members of the Automobile Club of Delaware county were hailed before him for exceeding the 15-mile speed limit after it was pointed out that the signs were illegally worded. And now the club has found Constable Thompson violated the law by operating a Chevrolet with a license that had been issued for a Ford. He neglected to register the transfer and each time he drove the car under the same license number constituted a separate violation. He is charged with only two, however.

M. L. Pulcher Heads New Detroit Club—M. L. Pulcher will have the honor of being the first president of the new Detroit motor club when the organization perfects its charter membership plans. Mr. Pulcher is the vice president and general manager of the Federal Motor Truck Co. W. S. Gilbreath, secretary of the club, announces that the 1,000 mark will soon be reached. The club incorporates a novel and interesting clause in its charter membership application, which reads: "We do further agree, in furtherance of the interests of said organization, to abide by and comply with all state laws and city ordinances governing and controlling traffic on the public highways in the state and streets and highways in the cities and to co-operate with and assist officials in every manner possible in compelling proper enforcement of said laws."

MEG WATCHES THE CAR—Dogs are known to have prevented loop thefts in Chicago amounting to thousands of dollars. They are trained to remain on guard in parked cars while masters and mistresses are doing their shopping and attending to other duties. Here is a picture of an Airedale guardian of wraps, robes and packages left in cars. Her name is Meg, her home is in Lake Forest, and her master would as soon think of leaving his chauffeur behind as to go off on a drive without Meg.

Coming Motor Events

RACES

—1916—

*October 28—Harkness Trophy, New York Speedway.
*November 16—Vanderbilt cup race, Santa Monica, Cal.
*November 18—Grand prize race, Santa Monica, Cal
*November 30—Speedway, Los Angeles, Cal.
*December 25—Speedway, Los Angeles, Cal.

—1917—

May 19—Metropolitan Trophy, New York speedway.
†May 30—Indianapolis speedway.
†June 9—Chicago speedway.
June 23—Cincinnati speedway
†July 4—Omaha speedway.
†July 14—Des Moines speedway.
†July 28—Tacoma speedway.
August 4—Kansas City speedway.
†September 3—Cincinnati speedway.
†September 15—Providence speedway.
†September 29—New York speedway.
October 6—Kansas City speedway.
October 13—Chicago speedway.
October 27—New York speedway.

* Sanctioned by A. A. A.
† A. A. A. championship events for 1917.

MEETINGS

January 9-11—Mid-winter meeting, Society of Automobile Engineers.

SHOWS

October 15-November 1—Omaha, Neb., closed car salon.
January 6-13—New York show.
January 13-20—Montreal.
January 27-February 3—Chicago show.
February 18-25—St. Louis, Mo., show.
February 26-March 3—Omaha, Neb., show.
March 3-10—Boston.
March 6-10—Fort Dodge, Ia., show.

Good Roads Activities

N. D. to Get $76,143 for Roads—North Dakota has 4,170 miles of national, state and county highways eligible to participate in the federal aid fund. The initial share will be $76,143.06.

Connecticut Towns Mark Roads—Through the state of Connecticut the smaller towns are now marking the highways with guide posts, which are placed in the center of the road at intersections. The signs are about 4 feet high and surmounted by a red flag. On each face of the post is painted the words, "Keep to the Right."

Section of Midland Trail Inspected—An inspection trip over the Midland Trail between Louisville, Ky., and Vincennes, Ind., for the purpose of encouraging improvement and marking of the road and the formation of additional local organizations in Indiana, was made last week. Several cars took part, and a big road meeting took place in Vincennes.

Hartford Club Erects Signposts—The sign board committee of the Automobile Club of Hartford, Conn., has been very active this season in placing signs through Hartford county. The committee recently finished the installation of signs along the main thoroughfares in Hartford, these being in different colors to correspond with the band markers adopted by the state highway department.

Detroit Automobile Club Active for Good Roads—The new Detroit Automobile Club is already displaying its importance by activity in favor of good roads in and near Detroit. The board of county road commissioners of Wayne county has requested the board of supervisors to levy one-fourth of a mill county road tax for 1917 for the purpose of continuing to build and maintain county roads in Wayne county.

Among the Makers and Dealers

HAULING EMPLOYES TO AND FROM HOME—As the problem of rush-hour increase with the growth of cities and the concentration of large manufacturing plants, unique plans are devised for handling the army of workmen wishing to reach their homes within the shortest possible time. The photograph shows how this problem is solved at the factories of the Hyatt Roller Bearing Co. At Harrison, N. J., twice each day, when the shifts change. The plan meets with favor with the employes.

NEW Factory to Cost $50,000—The Auto Supply and Equipment Co., Long Island City, N. Y., has had plans prepared for a five-story factory, 50x110 ft., to cost about $50,000.

Goodyear Shipments 400 Tons in 1 Day—The Goodyear Tire and Rubber Co. last week shipped nearly 400 tons of Goodyear product from the factory of Akron, O., in 1 day.

Thompson Now with Miller—C. S. Thompson has been appointed advertising director of the Miller Rubber Co., Akron, O. Mr. Thompson was formerly president of the Thompson-Carroll Co., Cleveland, O.

Barth to Manage Wilson Body—Charles F. Barth has been appointed works manager for C. F. Wilson Body Co., Detroit, Mich. Mr. Barth was formerly the factory and production manager for the Murphy Chair Co.

Veeder Manager for Wood Car—G. W. Veeder has been appointed retail sales manager of the Wood Dual Power car. For three years Mr. Veeder has been Chicago sales manager for the Anderson Electric Car Company, maker of the Detroit electric.

Anderson Goes to Madison Corp.—Harry W. Anderson has been chosen sales manager of the newly organized Madison Motors Corp., Anderson, Ind. Mr. Anderson was formerly sales manager for the Stutz Motor Car Co. The new company recently was incorporated with a capitalization of $2,000,000.

N. Y. Concern Opens Milwaukee Branch—The Times Square Auto Supply Co., Inc., New York, has opened a branch in Milwaukee, Wis. The company was recently incorporated for $5,000,000 and is establishing new branches in different parts of the country, with the purpose of having fifty stores in operation by May of 1917.

Clyde Truck Company Buys Land—The Clyde Motor Truck Co., recently organized to bring out a standardized 1-ton truck at the popular price of $1,000, has bought 40 acres of land at Farmingdale, L. I., just outside New York and will begin immediately the erection of daylight factory buildings, general offices and laboratories there. W. F. Melhuish, formerly with the White Motor Co., and A. F. Mais, formerly chief engineer of the Studebaker Corp., are members of the company's personnel.

Tisch Gets Dean Knife Timer—The Tisch Auto Supply Co., Grand Rapids, Mich., has purchased the rights to the Dean knife timer for Ford cars and will manufacture them under the supervision of W. B. Dean.

Chase Company Promotes Abbott—The Chase Motor Truck Co., Syracuse, N. Y., has promoted Leon H. Abbott, formerly manager of the service department, to the position of assistant sales manager.

Canadian Ford Earns 15.8 Per Cent—The net earnings of the Ford Motor Co. of Canada, Ltd., for the fiscal year of 10 months ended July 31, after deduction of $716,136 for special war taxes, were $1,109,322.14. The net earnings are equivalent to 15.8 per cent on the outstanding $7,000,000 of the company's authorized $10,000,000 of capital stock.

Republic Rubber Issues Stock—The Republic Rubber Co., Youngstown, O., has offered 10,475 shares of its common stock pro rata, at par, to its common stockholders. The proceeds, about $1,000,000, will be used for working capital and extensions. The additional stock issue is equivalent to 40 per cent of the present outstanding common stock, which is $2,500,000. The outstanding preferred amounts to $3,450,000.

Wisconsin Graphite Property Sold—The entire property and holdings of the Wisconsin Graphite Co., Stevens Point, Wis., were purchased at assignor's sale by John Strange, paper magnate, Neenah, Wis., who probably will continue to operate the mines and mill. The property brought $28,500, or a sum considerably in excess of the current liabilities. The company was capitalized at $100,000.

Melon for Bower Bearing—The Bower Roller Bearing Co., Detroit, Mich., has declared its third quarterly cash dividend of 15 per cent, making 45 per cent paid in cash dividends this year. In addition to this cash dividend the directors have recommended that a stock dividend of 100 per cent be declared by the stockholders at their annual meeting in January, 1917. At the same time that Bower stock is paying 5 per cent per month, the company is making extensive increases in equipment and production.

New Dobie Agency in Arizona—The Arizona Engineering Co. has been appointed agent in the territory of Kingman, Ariz., for the Doble steam car.

Wierengo Detroit Truck G. M.—John L. Wierengo has been appointed general manager of the Detroit Tank Co., Detroit, Mich., maker of the Tonford truck. Mr. Wierengo was formerly advertising and sales manager for the Continental Motors Co.

Plath Joins Harroun Motors—John J. Plath has been appointed director of distribution for the Harroun Motors Corp., Detroit, Mich. Mr. Plath recently resigned from the Maxwell Motor Co., where he held the position of sales manager.

Goodrich Company Has Vast Gain—The B. F. Goodrich Co., Akron, O., reports a total overturn this year of possibly $77,000,000. Actual shipments of products for the 8 months ended September 1 amounted to approximately $50,000,000, a gain of 40 per cent over the same period last year. The total business of the Goodrich company for 1912 was $37,533,000.

Oakland Factory Entertains—Officials, branch managers and distributors took part in the 3-day annual meeting of the Oakland Motor Car Co., which ended last Saturday. Business sessions were held, at which 1917 Oakland policies were discussed. Much time was spent in the shops, where first-hand information of a mechanical and technical nature was obtained. A banquet was given in honor of the visitors last night.

Springfield Overland Opening—Dealers and owners throughout the territory covered by the Springfield, Mass., Overland branch attended the opening of the new sales and service building. The structure is four stories high and has 75,000 square feet of floor space. The doors and the pump, which delivers gasoline to all parts of the building, are electrically operated. A garage on the second floor for transients is reached with-

out an elevator. The second floor will hold 150 cars and the third floor, 250, some being suspended from the ceiling.

Ericston Resigns from Scripps-Booth—Charles A. Ericston, chief engineer for the Scripps-Booth Co., Detroit, Mich., has resigned.

Wright Is Cassidy Representative—E. C. Wright, former eastern district sales manager for the Carter Carbureter Co., has become a representative of the E. A. Cassidy Co.

Kramm Foundry Expands—The Kramm Foundry Co., Indianapolis, Ind., has just completed its new addition, which will make the capacity three times as large as before and has incorporated for $50,000.

Everitt Tractor Given Tests—B. Everitt has recently given his Everitt tractor a series of tests on Michigan farms. Hundreds of acres have been turned up and in one test 11 acres were plowed in 9½ hours.

Tire Company to Have Bonus—Cumberland, Md., has raised $75,000 of the $150,000 subscription which is to bring the plant of the Kelly Springfield Tire Co. there and will also vote on the proposition to issue $500,000 worth of bonds for improvements necessary to the project.

Turk Inter-State Assistant G. M.—T. J. Turk, chief engineer of the Inter-State Motor Co., Muncie, Ind., has been appointed assistant general manager of the company. In connection with his new duties, Mr. Turk also will retain charge of the engineering department.

Goodyear Holds Conference—A sales conference of the Goodyear Tire and Rubber Co. was held last week, when district and branch managers assembled at Akron, as the company's guests. The record for the present year was reviewed and plans formulated for 1917.

Kopf Specializes in Electrical Lines—M. G. Kopf, formerly chief engineer of the McCormick Laboratories, Dayton, O., has opened an office at 620 Chemical building, Chicago, and will specialize in chemical electrical lines as applied to motor car engineering and patent matters requiring engineering knowledge.

Claims Largest Garage in State—Madison, Wis., claims the largest garage in the state since the Ritter Auto Co. will move into one which will accommodate 200 cars and cover an entire block, January 1. The company has been selling Hudsons in this territory for 5 years and also has taken over the Franklin agency.

New Tire Company Formed—The Automobile Tire Co., which has a chain of stores through the United States, has bought a factory at Beacon, N. Y., and will make its own tires. The name of the new company is the Beacon Tire Mfg. Co., and E. C. Griffith, president of the Automobile Tire Co., heads it. An output of 150 tires a day is planned, and the first lot is expected the latter part of this month.

Double Service Company Expands—An increase in the capital stock of the Double Service Tire and Rubber Co., Akron, O., from $50,000 to $250,000 has been made.

Takes Over Agency for Empire—The Standard Motors Corp., Kansas City, Mo., has taken over the agency for the Empire car in Kansas and Western Missouri. The Topeka, Kans., agency will also be held by this corporation.

South Bend Studebaker Agency Builds—The Studebaker Corp., South Bend, Ind., is to build a one-story building to cost $30,000. It will be used as a service station, stock room, display room and repair shop. The building will be so constructed that an additional story may be added later.

Alabama Motors to Sell Premier—The Alabama Motors, Inc., have obtained the Alabama and western Florida territory for the Premier. F. P. Merritt, a member of the company, recently had charge of the wholesale sale of the Premier in the South.

To Erect $100,000 Building—A proposed expenditure of $100,000 in Salt Lake City for the erection of one of the largest motor car quarters in the state of Utah has been announced from Ogden by officers of the Browning Automobile & Supply Co.

Augusta Merchant to Sell Cars—W. S. Cannon, a business man interested in cotton in Augusta, Ga., has opened a garage and salesroom and will handle the Cadillac and Oldsmobile in a territory of twelve counties in the Augusta district.

Freese to Manage Gibson Branch—Earl Freese, Indianapolis, has been appointed manager of the Logansport, Ind., branch of the Gibson Co., Overland distributors and accessory dealers. He will succeed E. C. Kurman, who has been made manager of the Gibson Co.'s Indianapolis branch.

Waukesha Motor Adds—The Waukesha Motor Co., Waukesha, Wis., will erect an administration building, which will embody quarters for the engineering department and drafting rooms. The building is to be of brick and steel, 44 by 88 feet, two stories and basement, and cost $25,000.

Saxon Corporation Trains Inspectors—The Saxon Motor Car Corp. has seventy inspectors who check up on the workmen, and to insure proper familiarity with the Saxon car on the part of these inspectors, the corporation is holding classes. The inspectors take notes as each part of a chassis is explained.

Forge Concern Expanding—The Ladish-Obenberger Drop Forge Co., Milwaukee, has arranged for considerable extensions of its plant in Cudahy, Milwaukee county, Wis. Ground has been broken for a one-story steel and brick addition, 50 by 200 feet. The plant has been operated on a 24-hour basis for many months, due largely to the unprecedented demands from the motor car industry of the middle west.

Boone Chief Engineer for Disco—John T. Boone has been appointed chief engineer for the Disco Electric Starter Corp. Mr. Boone was formerly chief engineer for the Heinze Electric Co., Springfield, O.

Partridge Rubber Co. Acquires New Plant—The Standard Tire and Rubber Co., Guelph, Ont., Can., has sold its plant to the Partridge Rubber Co., Ltd. The Partridge company is preparing to install machinery now in use in its Montreal factory.

Miller Now with Inland—L. B. Miller, St. Louis, Mo., has resigned as manager of the St. Louis branch of the U. S. Tire Co. to become general sales manager for the Inland Machine Works, maker of the Inland piston rings. Mr. Miller had been with the U. S. Tire Co. since March 1, 1913.

Empire Agency for All Texas—The Couch Auto Association, Dallas, Tex., is distributor for the Empire car in practically the whole state of Texas. L. F. Bullock, formerly with the White Co., and G. H. Yorty, formerly manager of Fellows Motor Co., are officials of the Couch concern.

New Building for Accessory Company—W. C. Redlin, Minneapolis, Minn., is building a $75,000 structure for Reinhard Bros., accessory dealers, which will be fire-proof throughout and consist of four stories and a basement. The concern will occupy the entire building and have a large showroom on the first floor. The design is for eight floors eventually.

Would Locate at Waukesha—E. H. Orersmith, Jonesville, Mich., who is building motor trucks of the front-drive type on a small scale, is negotiating with the business men's association of Waukesha, Wis., with a view to establishing a large plant at that point. Waukesha is favored because of its numerous industries allied with the motor car and truck industry.

Manufacturer of Parts to Build—The Kent Motors Corp., New York, recently incorporated, has acquired a tract of land near Hillside Park, Belleville, and plans the erection of a plant with a total area of about 120,000 square feet for the manufacture of motor car parts. The plant will comprise one-story structures of reinforced concrete, including a powerplant and an administration building.

New Hoosier Crow-Elkhart Distributor—The Mertz-Cadle Sales Co. has been organized at Indianapolis, Ind., to take over the state distribution of Crow-Elkhart cars. The cars formerly were distributed through the Colonial Automobile Co., Indianapolis. The new company is composed of Fred P. Mertz, former Crow-Elkhart state distributor through the Colonial company, and F. H. Cadle, who has been in charge of the com-

Overland ambulances photographed in Australia before being sent to the battlefront in Egypt

pany's Marion county sales. The new company has assumed the lease on the building formerly occupied by the Colonial Automobile Co.

Lewis a Banker—W. M. Lewis, former president of the Mitchell-Lewis Automobile Co., Racine, Wis., has been made vice-president of the new Bankers' Trust Co. & Savings Bank, Minneapolis, Minn.

Colfax Mfg. Co. Buys Concern—The Frederick W. Loomis Co., manufacturer of motor car tops, has been bought by the Colfax Mfg. Co. of South Bend, Ind.

Hutchinson Overland Branch Manager—Guy Hutchinson has joined the Willys-Overland Co. to act as branch manager for Willys-Overland Inc., New York. Mr. Hutchinson was formerly sales manager and treasurer of Hart & Hutchinson.

Spalding St. Louis Association Director—H. W. Spalding, vice-president of the Packard Missouri Motor Co., St. Louis, Mo., has been elected a director of the St. Louis Automobile Manufacturers and Dealers Asssociation, vice R. R. Doak of the Woods Electric Co. Mr. Doak recently went to Cleveland, O., where he will join the factory force of the Ohio Electric.

Ben Hur Co. in St. Louis—The Ben Hur Co. of America, fiscal agents for the Ben Hur Motor Co. of Cleveland and the Ben Hur St. Louis Motor Co., has opened offices in St. Louis. The company has applied for incorporation with a capital stock of $200,000 and will be one of the ten large distributing companies of the Cleveland company. Forty-nine per cent of the stock is to be sold in St. Louis.

New Building for American Brass—The American Brass Co., Kenosha,, Wis., is to erect an office building, 48 by 100 feet, three stories and basement, and a private garage and service shop, 30 by 120 feet, one story high. Both structures will be of fireproof construction, equipped with sprinkler systems. The work is part of the extensive enlargement scheme announced by the concern several months ago, as noted at the time.

Savage Opens Branch in Detroit—The Savage Tire Corp., San Diego, Cal., has opened a factory branch in Detroit, Mich. S. E. Straight will be in charge for the entire state of Michigan as the branch manager.

Economizer Maker Seeking Site—The Thomas Mfg. Co., Streator, Ill., which manufactures a motor car attachment claimed to reduce gasoline consumption, has been investigating the situation with a view of building a branch factory at Wichita Falls, Tex.

Agency Takes Factory's Name—To obtain more benefit from national advertising of the International Rubber Co., the New Tread Tire Co., which handles the International's treads in Louisville, Ky., has changed its name to the International Rubber Sales Co.

Scripps-Booth Manager—A. E. Schaefer has been made business manager of the Scripps-Booth Corp., Detroit, Mich. Mr. Schaefer was business manager for the Sterling Motor Co. prior to its merger with the Scripps-Booth company.

Maxwell Erecting Many Buildings—Work has been started on the new assembling plant for the Maxwell Motor Co. at Kansas City, Mo., which will be ready for occupancy about the first of the year and which will cost $300,000. Present plans include the erection of assembly plants in Minneapolis and Windsor, Can.

Dealers Form Organization—The Howard County Automobile Trade Association, with headquarters at Kokomo, Ind., has been organized to promote a better understanding among agents. Officers are: President, George W. Dickey; vice president, Emil F. Weaver; secretary, R. P. Seaward, and treasurer, M. R. Shaffer. All the motor car dealers in the county will be asked to attend a banquet to be given in the near future.

Two Additions Planned—The William Hughes Co., Providence, R. I., will add a one-story shop and fireproof building to its motor car plant. The cost will be $30,000.

Kenyon Resigns from Sandow—W. E. Kenyon will resign as general sales manager of the Sandow Motor Truck Co., Chicago, November 15. His future plans are not definite at this time.

Pullman Gets Sphinx Plant—The Pullman Motor Car Co., York, Pa., has leased the plant of the Sphinx Motor Car Co., and will use it for making bodies and other sheet metal parts.

Fisks Building at Milwaukee—Work is under way on the six-story manufacturing building for the Federal Rubber Mfg. Co. at Cudahy, Milwaukee county, Wis. It will be 100 by 157 feet and cost $200,000. It is one of the principal units of the $1,000,000 improvement scheme undertaken some time ago, after the Fisk interests bought the controlling interest from the Milwaukee stockholders.

Locktite to Enlarge—The Locktite Patch Co., Detroit, Mich., is adding to its plant which will quadruple the present manufacturing facilities. Coincident with the plans for enlargement is the production of a perfected tire patch on which is placed an absolute guarantee that no heat or special tools are required and that the patch will never leak, pull loose or burn off.

Rainier Gets Site—The Rainier Motor Corp., New York, maker of trucks, has purchased 5½ acres of land on the edge of the Flushing-College Point meadows, upon which it will establish a plant for the manufacture of its products. Two one-story buildings will be erected at a cost of $53,000. One will be 50 by 100 feet and the other will be 200 by 200 feet. Ground was broken last week for the first building.

Arlington, Ky.—Neville Automobile Co.; capital stock, $5,000; incorporators, R. R. Neville, H. C. Neville, N. W. Neville and J. H. Payne.

capital stock, $300,000; to manufacture all kinds of parts; incorporators, S. S. Kurtz, J. M. Kurtz.

Boston, Mass.—Jack Stone Auto Co.; capital stock, $5,000; incorporators, L. H. Resulk, Moses Resulk, John Stone, Samuel Resulk, W. J. Lessard.

Columbus, O.—Babcock Gallagher Co.; capital, $5,000; to deal in motor car parts; Vincent L. Gallagher, William J. McCauley, R. E. Simmonds, Jr., W. C. Mardorf and E. B. Finch.

bell, Selden S. Dickinson and Wilson B. Mills.

Columbus, O.—McClure Tire & Rubber Co.; incorporators, J. A. McClure, Jr., E. Buchanan, Robert McClure.

Chicago—Standard Motor Parts Co.; capital stock, $2,500; incorporators, P. Q. Wray, Estella B. Ray, F. C. Harbour.

Chicago—Hope Motor Livery Co.; capital stock, $1,500; incorporators, James P. Marzano, Annie B. Marzano, Joseph A. Marzano.

Cincinnati, O.—Cincinnati Auto Specialty Co.; capital stock, $10,000; incorporators, Albert W. Connor, Lee Harburger, B. L. Schurman, S. M. Harburger, T. A. Ryall, W. A. Moore.

Cincinnati, O.—U-Need-S Starter Co., capital stock, $3,000; to manufacture and deal in accessories; incorporators, Frank Hartung, Charles Weigel, Edw. N. Hempelman, William Hector and George F. Eyrich, Jr.

Cincinnati, O.—Cincinnati Auto Specialty Co.; capital stock, $10,000; to deal in accessories and supplies; incorporators, Albert W. Connor, Lee Harburger, B. L. Schurman, S. M. Harburger, T. A. Ryall and W. A. Moore.

Chicago—Midland Auto Co.; to deal in motor cars; capital stock, $10,000; incorporators, E. B. Cahn, Harry Goodman and William R. Swissler.

Canton, O.—Canton Auto Parts Mfg. Co.;

Canton, O.—Canton Auto Parts Mfg. Co.; capital stock, $300,000; to manufacture motor car parts; incorporators, S. S. Kurtz, J. M. Kurtz, James K. Lynch, M. A. Yeakley, S. S. Kurtz, Jr., and F. M. Murphy.

Cleveland, O.—Ohio Tire Fabric Co.; capital stock, $10,000; to manufacture tire fabrics; incorporators, John J. Davis, Joseph J. Kroupa, M. M. Boczeck, H. M. Bliss, J. A. Elden and Frank J. Cibulka.

Cleveland, O.—Tire Rebuilding Co.; capital stock, $10,000; incorporators, C. S. Stork, J. A. Parsons, M. V. Parsons, Charles Reeder, John J. Metzger.

Cleveland, O.—Bondy Auto Top Co.; capital stock, $10,000; to manufacture automobile tops; incorporators, E. R. Bondy, Fred L. Tesmer, Charles M. Boncy, Harry Loeb and R. W. Bondy.

Cleveland, O.—Tire Rebuilding Co.; capital stock, $10,000; to repair tires; incorporators, C. S. Burk, J. A. Parsons, M. V. Parsons, Charles Reeder and John J. Metzger.

Dover, Del.—A. C. Axle Mfg. Co., to manufacture driving machines for motor vehicles; capital stock, $1,000,000; incorporators, H. W. Savage, A. P. Fish, A. C. Bennett.

Dover, Del.—C. A. C. Products; to manufacture and deal in motor cars and vehicles; capital stock, $3,000,000; incorporators, G. S. P. Kleeberg, Sidney S. Krim, David Kassell.

Dover, Del.—Knights of the Motor World; to promote the welfare of persons engaged in the motor car business; incorporators, R. I. Erlichman, A. L. Seltzer, C. P. Brewster, Michael Shapiro, T. G. McGohan, A. J. Erlichman and others.

Detroit, Mich.—Dewey-Bergeron Motor Co.; capital stock, $25,000; to deal in motor cars; incorporators, Frederick C. Dewey, Arthur Bergeron and Phelps Newberry.

Detroit, Mich.—New Era Spring & Specialty Co.; capital stock, $50,000; incorporators, William S. Daniels, Ethel P. Fulmer and William B. Blood.

Detroit, Mich.—Venus Dry Storage Battery Co.; capital stock, $50,000; incorporators, William J. Malloy, Muir B. Duffield and Frederick O'Hearn.

Detroit, Mich.—Lewis Motor Co.; capital stock, $10,000; incorporators, Douglas Camp-

Duluth, Minn.—Service Motor Co.; capital stock, $50,000; incorporators, L. L. Loucks, P. K. Priest and G. J. O'Hare.

Elyria, O.—Elyria Auto Service Co.; capital stock, $10,000; incorporators, M. J. Lepper and others.

Fort Wayne, Ind.—Anthony Auto Lifter Co.; to manufacture mechanical appliances, machinery, etc.; capital stock, $10,000; incorporators, C. O. Blee, W. O. Chaney and G. F. Seymour.

Ford, Ont.—Canadian Lamp & Stamping Co.; capital, $100,000; incorporators, G. E. Edmonds, W. T. Jones and H. Bedford.

Fond du Lac, Wis.—The Johnson Motor Co.; capital stock, $20,000; incorporators, F. A. Johnson, A. E. Knop and T. J. Wheaton.

Fond du Lac, Wis.—Johnson Motor Co., to operate a garage, repairshop, agency and accessory business; capital stock, $20,000; incorporators, F. A. Johnson, Arnold Knop and T. H. Whalon.

Hamilton, Ont.—Walker Automobile Supply Co.; capital stock, $40,000; incorporators, F. J. Walker, R. P. McBride and H. S. Lees.

Harrisburg, Pa.—Auto Battery Service Co.; capital stock, $5,000; incorporators, Louis E. Gelinas.

Indianapolis, Ind.—Cadillac Automobile Co.; capital stock.

Indianapolis, Ind.—Indianapolis Motor School, to teach the operation, construction and repair of motor cars; capital stock, $5,000; incorporators, Q. G. Noblitt, F. H. Sparks, H. M. Stanton.

Jackson, Mich.—L. C. Auto Co.; capital stock, $25,000; to manufacture and deal in motor cars; incorporators, Fred Clarke, Arthur W. Leete, H. V. Weed.

Kansas City, Mo.—Liberty Motor Co.; capital stock, $10,000; incorporators, Herbert G. Shimp, Charles A. Richter and C. V. Curtis. They will handle the Liberty.

Montreal, Can.—Just Motor Limited; capital, $40,000.

Milwaukee, Wis.—Milwaukee Auto Livery Co.; capital stock, $2,500; incorporators, John W. Mau, Faun R. Norris and Ernst R. Jeske.

Milwaukee, Wis.—The LeRoi Co.; to manufacture engines, tools, machinery, etc.; capital stock, $350,000; incorporators, William C. Quarles, Julian Olds and J. A. Dietrich.

Newark, N. J.—Brick Church Auto & Taxi Co.; to manufacture and deal in motors, engines and machinery; capital stock, $10,000; incorporators, J. A. Knowled, C. N. J. Joseph, G. Browne, Robert K. Shoemaker.

New York—Kent Motor Corp., to manufacture motors of all kinds; capital stock, $100,000.

Paducah, Ky.—Gus Edwards Motor Sales Co.; capital stock, $5,000; incorporators, George W. Katterjohn, A. G. Edwards and Mrs. Maud Katterjohn.

Parkersburg, W. Va.—H. Marsh & Co., to deal in motor cars, trucks, motor and motor vehicles of all kinds; capital stock, $10,000; incorporators, H. Marsha, E. V. Marsh, Eldorus McCoy, H. V. Dodge and C. T. Smith.

Paterson, N. J.—Arnold Motor Car Co.; capital stock, $100,000; general motor car business.

Rice Lake, Wis.—The Rice Lake Motor Car Co.; to operate a garage, deal in new and used cars, and do repair work; capital stock, $15,000; incorporators, Gustave Paradise, R. A. Beaudette and W. N. Scott.